

EXHIBIT A

PTO/SB/57 (04-05)

Approved for use through 04/30/2007. OMB 0651-0033

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

(As so referred to as FORM PTO-1465)

REQUEST FOR EX PARTE REEXAMINATION TRANSMITTAL FORM

Address to:
 Mail Stop *Ex Parte* Reexam
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

Express Mail EB403367364

Attorney Docket No.: 26.2.965/USA

Date: April 5, 2007

1. ☒ This is a request for *ex parte* reexamination pursuant to 37 CFR 1.510 of patent number 5,533,325 issued July 9, 1996. The request is made by:
- ☒ patent owner. ☐ third party requester.
2. ☒ The name and address of the person requesting reexamination is:
- The Toro Company
- 8111 Lyndale Avenue South
- Bloomington, Minnesota 55402
3. ☐ a. A check in the amount of \$_____ is enclosed to cover the reexamination fee, 37 CFR 1.20(c)(1);
- ☒ b. The Director is hereby authorized to charge the fee as set forth in 37 CFR 1.20(c)(1) to Deposit Account No. 20-1315 (submit duplicative copy for fee processing); or
- ☐ c. Payment by credit card. Form PTO-2038 is attached.
4. ☒ Any refund should be made by ☐ check or ☒ credit to Deposit Account No. 20-1315 37 CFR 1.26(c). If payment is made by credit card, refund must be to credit card account.
5. ☒ A copy of the patent to be reexamined having a double column format on one side of a separate paper is enclosed. 37 CFR 1.510(b)(4)
6. ☐ CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table
☐ Landscape Table on CD
7. ☐ Nucleotide and/or Amino Acid Sequence Submission
If applicable, items a. – c. are required.
- a. ☐ Computer Readable Form (CRF)
- b. Specification Sequence Listing on:
- i. ☐ CD-ROM (2 copies) or CD-R (2 copies); or
- ii. ☐ paper
- c. ☐ Statements verifying identity of above copies
8. ☐ A copy of any disclaimer, certificate of correction or reexamination certificate issued in the patent is included.
9. ☒ Reexamination of claim(s) 1-18, 20-25 is requested.
10. ☒ A copy of every patent or printed publication relied upon is submitted herewith including a listing thereof on Form PTO/SB/08, PTO-1449, or equivalent.
11. ☒ An English language translation of all necessary and pertinent non-English language patents and/or printed publications is included.

[Page 1 of 2]

This collection of information is required by 37 CFR 1.510. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop *Ex Parte* Reexam, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/57 (04-05)

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12. ☒ The attached detailed request includes at least the following items:

- a. A statement identifying each substantial new question of patentability based on prior patents and printed publications. 37 CFR 1.510(b)(1)
- b. An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited art to every claim for which reexamination is requested. 37 CFR 1.510(b)(2)

13. ☐ A proposed amendment is included (only where the patent owner is the requester). 37 CFR 1.510(e)14. ☐ a. It is certified that a copy of this request (if filed by other than the patent owner) has been served in its entirety on the patent owner as provided in 37 CFR 1.33(c).

The name and address of the party served and the date of service are:

Date of Service: _____; or

☐ b. A duplicate copy is enclosed since service on patent owner was not possible.

15. Correspondence Address: Direct all communication about the reexamination to:

☒ The address associated with Customer Number:

61145

OR

☐ Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

16. ☒ The patent is currently the subject of the following concurrent proceeding(s):

- ☐ a. Copending reissue Application No. _____
- ☐ b. Copending reexamination Control No. _____
- ☐ c. Copending Interference No. _____
- ☒ d. Copending litigation styled: _____

The Toro Company v. Textron, Inc. et al

in the United States District Court for the District of Minnesota, Civil Action No. 05-1835 (PJS/JJG)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Authorized Signature

Date

James W. Miller

27,661

Typed/Printed Name

Registration No.

☒ For Patent Owner Requester☐ For Third Party Requester

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 26.2.965/USA

In re Patent of:)
Steve A. Sallstrom et al.)
Patent No. 5,533,325)
Issued July 9, 1996)
For ALL-WHEEL HYDRAULIC)
DRIVE SYSTEM)

DETAILED REQUEST FOR EX PARTE PATENT REEXAMINATION

Mail Stop *Ex parte* Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR 1.510, The Toro Company, the patent owner requester, hereby requests *ex parte* reexamination of U.S. Patent 5,533,325. A Request for *Ex parte* Reexamination Transmittal Form (PTO/SB/57) is attached hereto.

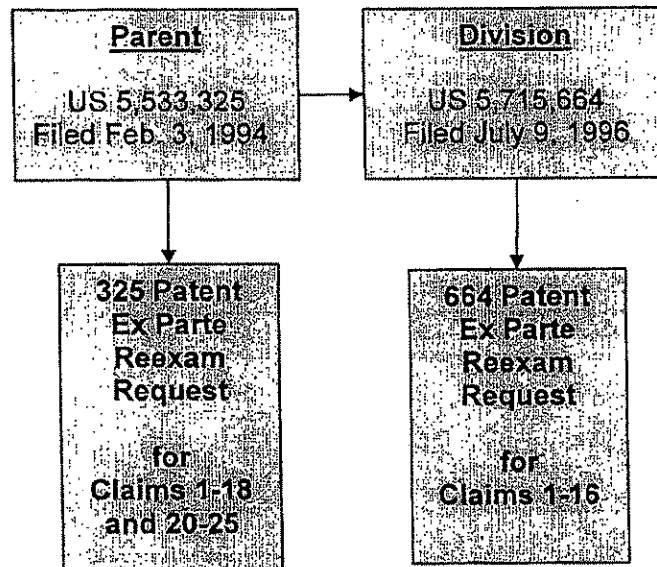
The 325 patent is currently involved in patent litigation entitled The Toro Company v Textron Inc., et al. in the United States District Court for the District of Minnesota, Civil Action No. 05-1835 (PJS/JJG).

Toro requests that claims 1-18 and 20-25 of the 325 patent be reexamined. These are the same claims of the 325 patent that have been asserted by Toro against various Textron products in the above-identified litigation.

This request is based on at least some prior art references that are not of record in the original examination of the 325 patent. This prior art may raise substantial new questions of patentability regarding the 325 patent.

Identification of Related Patents and Reexaminations

There are two Toro patents at issue in the pending litigation between Toro and Textron. Both patents deal with related subject matter. **Individual Reexamination Requests of each patent are being filed simultaneously in the PTO.** The patents, Reexamination Requests, and claims in each patent for which reexamination is requested are identified in the flowchart below:

**Patents and Printed Publications Relied Upon In This Request**

The defendants in the above-entitled litigation have asserted invalidity of various claims of the 325 patent based upon the following patents and printed publications:

Patents

- US 2,953,164 dated Sept. 20, 1960 to Haberland et al.
- US 3,955,464 dated May 11, 1976 to Dunn.
- US 4,227,364 dated Oct. 14, 1980 to Scherbring.
- EP 0,547,947 dated June 23, 1993 to Poclain (with attached translation).

Printed Publications

- Toro Greensmaster 3100 brochure dated 1991.
- Toro Reelmaster 355-D brochure dated 1990.
- Ransomes Fairway 5000 Mower brochure dated 1989.

The Toro Greensmaster 3100 brochure appears to have been of record in the prosecution of the 325 patent, but the other prior art patents and printed publications are newly cited and are not of record in the prosecution of the 325 patent.

**Statement Pointing Out Each Alleged
Substantial New Question of Patentability**

The defendants in the above-entitled litigation have filed a paper entitled Defendants' Prior Art Statement which asserts various grounds of invalidity against claims 1-18 and 20-25 of the 325 patent based upon the prior art listed above. Such assertions of invalidity are summarized by defendants on pages 1 and 2 of the Defendants' Prior Art Statement. The PTO is referred to this summary as comprising the statement pointing out each alleged substantial new question of patentability that arguably exists as to the claims of the 325 patent.

**Detailed Explanation of the Pertinency and Manner of Applying the
Patents and Printed Publications to Every Claim of the 325 patent for Which
Reexamination Is Requested**

Pages 4-25 of the Defendants' Prior Art Statement contain Table 1 which comprises a claim chart that applies the prior art cited above to claims 1-18 and 20-25 of the 325 patent. This claim chart as contained in Table 1 comprises the detailed explanation of the pertinency and manner of applying the patents and printed publications to the claims for which reexamination is requested.

Summary

In view of the above, this request for ex parte reexamination of the 325 patent is proper and complete. It is respectfully requested that the PTO consider whether the prior art presented herewith raises any substantial new questions of patentability and whether patent reexamination of claims 1-18 and 20-25 of the 325 patent should be ordered.

April 5, 2007

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "James W. Miller", is written over a horizontal line.

James W. Miller
Registration No. 27,661
Suite 1960 Rand Tower
527 Marquette Avenue
Minneapolis, MN 55402

Date Mailed:

Sheet 1 of 1

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number:	Application Number: UNKNOWN
	Applicant: Sallstrom et al.	
	Filing Date: FILED HEREWITH	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
	US 2,953,164	09/20/1960	Haberland et al.				
	US 3,955,474	05/11/1976	Dunn				
	US 4,227,364	10/14/1980	Scherbring				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	EP 0 547 947 A1		European Patent Office			X	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
		Brochure, "Toro Greensmaster 3100," <i>The Toro Company</i> , 6 pgs. (1991)					
		Brochure, "Toro Reelmaster 335-D," <i>The Toro Company</i> , 4 pgs. (1990)					
		Brochure, "Fairway 5000 Mower," <i>Ransomes, Inc.</i> , 6 pgs. (1989)					

EXAMINER	DATE CONSIDERED
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.	

PTO/SB/57 (04-05)

Approved for use through 04/30/2007. OMB 0551-0033

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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(Also referred to as FORM PTO-1465)

REQUEST FOR EX PARTE REEXAMINATION TRANSMITTAL FORM

Express Mail EB403367347US

Address to:
Mail Stop Ex Parte Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attorney Docket No.: 26.2.965/B/USA

Date: April 5, 2007

1. ☒ This is a request for *ex parte* reexamination pursuant to 37 CFR 1.510 of patent number 5,715,664 issued February 10, 1998. The request is made by:

☒ patent owner.
 ☐ third party requester.
2. ☒ The name and address of the person requesting reexamination is:

The Toro Company
8111 Lyndale Avenue South
Bloomington, Minnesota 55402
3. ☐ a. A check in the amount of \$ _____ is enclosed to cover the reexamination fee, 37 CFR 1.20(c)(1);
☒ b. The Director is hereby authorized to charge the fee as set forth in 37 CFR 1.20(c)(1) to Deposit Account No. 20-1315 (submit duplicative copy for fee processing); or
☐ c. Payment by credit card. Form PTO-2038 is attached.
4. ☒ Any refund should be made by ☐ check or ☒ credit to Deposit Account No. 20-1315 37 CFR 1.26(c). If payment is made by credit card, refund must be to credit card account.
5. ☒ A copy of the patent to be reexamined having a double column format on one side of a separate paper is enclosed. 37 CFR 1.510(b)(4)
6. ☐ CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table
☐ Landscape Table on CD
7. ☐ Nucleotide and/or Amino Acid Sequence Submission
If applicable, items a. - c. are required.
 - a. ☐ Computer Readable Form (CRF)
 - b. Specification Sequence Listing on:
 - i. ☐ CD-ROM (2 copies) or CD-R (2 copies); or
 - ii. ☐ paper
 - c. ☐ Statements verifying identity of above copies
8. ☐ A copy of any disclaimer, certificate of correction or reexamination certificate issued in the patent is included.
9. ☒ Reexamination of claim(s) 1-16 is requested.
10. ☒ A copy of every patent or printed publication relied upon is submitted herewith including a listing thereof on Form PTO/SB/08, PTO-1449, or equivalent.
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(Page 1 of 2)

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PTO/SB/57 (04-05)

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12. ☒ The attached detailed request includes at least the following items:

- a. A statement identifying each substantial new question of patentability based on prior patents and printed publications. 37 CFR 1.510(b)(1)
- b. An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited art to every claim for which reexamination is requested. 37 CFR 1.510(b)(2)

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The name and address of the party served and the date of service are:

Date of Service: _____; or

☐ b. A duplicate copy is enclosed since service on patent owner was not possible.

15. Correspondence Address: Direct all communication about the reexamination to:

☒ The address associated with Customer Number: 61145

OR

☐ Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

16. ☒ The patent is currently the subject of the following concurrent proceeding(s):

- ☐ a. Copending reissue Application No. _____
- ☐ b. Copending reexamination Control No. _____
- ☐ c. Copending Interference No. _____
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The Toro Company v. Textron, Inc. et al

in the United States District Court for the District of Minnesota, Civil Action No. 05-1835 (PJS/JJG)

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Authorized Signature

Date

James W. Miller

Typed/Printed Name

27,661

Registration No.

☒ For Patent Owner Requester☐ For Third Party Requester

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 26.2.965/B/USA

In re Patent of:)
Steve A. Sallstrom et al.)
Patent No. 5,715,664)
Issued Feb. 10, 1998)
For ALL-WHEEL HYDRAULIC)
DRIVE SYSTEM)

DETAILED REQUEST FOR *EX PARTE* PATENT REEXAMINATION

Mail Stop *Ex parte* Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR 1.510, The Toro Company, the patent owner requester, hereby requests *ex parte* reexamination of U.S. Patent 5,715,664. A Request for *Ex parte* Reexamination Transmittal Form (PTO/SB/57) is attached hereto.

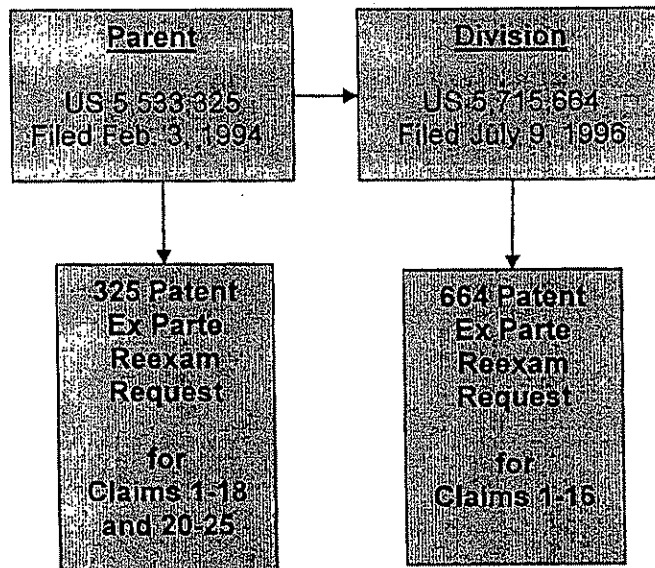
The 664 patent is currently involved in patent litigation entitled The Toro Company v Textron Inc., et al. in the United States District Court for the District of Minnesota, Civil Action No. 05-1835 (PJS/JJG).

Toro requests that claims 1-16 of the 664 patent be reexamined. These are the same claims of the 664 patent that have been asserted by Toro against various Textron products in the above-identified litigation.

This request is based on at least some prior art references that are not of record in the original examination of the 664 patent. This prior art may raise substantial new questions of patentability regarding the 664 patent.

Identification of Related Patents and Reexaminations

There are two Toro patents at issue in the pending litigation between Toro and Textron. Both patents deal with related subject matter. **Individual Reexamination Requests of each patent are being filed simultaneously in the PTO.** The patents, Reexamination Requests, and claims in each patent for which reexamination is requested are identified in the flowchart below:



Patents and Printed Publications Relied Upon In This Request

The defendants in the above-entitled litigation have asserted invalidity of various claims of the 664 patent based upon the following patents and printed publications:

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- US 2,953,164 dated Sept. 20, 1960 to Haberland et al.
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- US 4,227,364 dated Oct. 14, 1980 to Scherbring.
- EP 0,547,947 dated June 23, 1993 to Poclain (with attached translation).

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- Toro Reelmaster 355-D brochure dated 1990.
- Ransomes Fairway 5000 Mower brochure dated 1989.

The Toro Greensmaster 3100 brochure appears to have been of record in the prosecution of the 664 patent, but the other prior art patents and printed publications are newly cited and are not of record in the prosecution of the 664 patent.

**Statement Pointing Out Each Alleged
Substantial New Question of Patentability**

The defendants in the above-entitled litigation have filed a paper entitled Defendants' Prior Art Statement which asserts various grounds of invalidity against claims 1-16 of the 664 patent based upon the prior art listed above. Such assertions of invalidity are summarized by defendants on pages 1 and 2 of the Defendants' Prior Art Statement. The PTO is referred to this summary as comprising the statement pointing out each alleged substantial new question of patentability that arguably exists as to the claims of the 664 patent.

**Detailed Explanation of the Pertinency and Manner of Applying the
Patents and Printed Publications to Every Claim of the 664 patent for Which
Reexamination Is Requested**

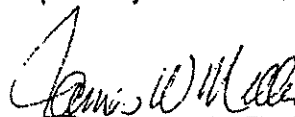
Pages 26-44 of the Defendants' Prior Art Statement contain Table 2 which comprises a claim chart that applies the prior art cited above to claims 1-16 of the 664 patent. This claim chart as contained in Table 2 comprises the detailed explanation of the pertinency and manner of applying the patents and printed publications to the claims for which reexamination is requested.

Summary

In view of the above, this request for ex parte reexamination of the 664 patent is proper and complete. It is respectfully requested that the PTO consider whether the prior art presented herewith raises any substantial new questions of patentability and whether patent reexamination of claims 1-16 of the 664 patent should be ordered.

April 5, 2007

Respectfully submitted,



James W. Miller
Registration No. 27,661
Suite 1960 Rand Tower
527 Marquette Avenue
Minneapolis, MN 55402

Date Mailed:

Sheet 1 of 1

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number:	Application Number: UNKNOWN
	Applicant: Sallstrom et al.	
	Filing Date: FILED HEREWITH	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
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	US 3,955,474	05/11/1976	Dunn				
	US 4,227,364	10/14/1980	Scherbring				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	EP 0 547 947 A1		European Patent Office			X	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
		Brochure, "Toro Greensmaster 3100," <i>The Toro Company</i> , 6 pgs. (1991)					
		Brochure, "Toro Reelmaster 335-D," <i>The Toro Company</i> , 4 pgs. (1990)					
		Brochure, "Fairway 5000 Mower," <i>Ransomes, Inc.</i> , 6 pgs. (1989)					

EXAMINER	DATE CONSIDERED
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.	

*Substitute Disclosure Statement Form (PTO-1449)

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

EXHIBIT B

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

THE TORO COMPANY,)	
)	
Plaintiff,)	Civil Action No. 05-CV-1835 PJS/JJG
)	
v.)	
)	
TEXTRON, INC.,)	JURY TRIAL DEMANDED
)	
JACOBSEN, A TEXTRON COMPANY,)	
)	
Defendants.)	

**THE TORO COMPANY'S SECOND CORRECTED MOTION TO STAY
LITIGATION PENDING DETERMINATION OF ITS REQUESTS FOR
REEXAMINATION BY
THE U.S. PATENT AND TRADEMARK OFFICE**

Plaintiff, The Toro Company ("Toro"), respectfully moves that this Court exercise its discretion to stay litigation pending determination of its request for reexamination and, if the request is granted, reexamination of U.S. Patent No. 5,715,664 and U.S. Patent No. 5,533,325 by the United States Patent and Trademark Office.

The grounds for this motion are stated in detail in the accompanying memorandum in support.

Dated: April 9, 2007

Respectfully submitted,

By: /s/ Anthony R. Zeuli
Earl D. Reiland #90426
Anthony R. Zeuli #274884
Joshua P. Graham # 386716
MERCHANT & GOULD P.C.
3200 IDS Center
80 South 8th Street
Minneapolis, MN 55402
(612) 332-5300

EXHIBIT C



HUNTON & WILLIAMS LLP
1751 PINNACLE DRIVE
SUITE 1700
MCLEAN, VIRGINIA 22102

TEL 703 • 714 • 7400
FAX 703 • 714 • 7410

CHRISTOPHER C. CAMPBELL
Direct Dial: 703-714-7553
EMAIL: CCAMPBELL@HUNTON.COM

FILE NO: 66866.000002

March 29, 2007

Via E-Mail

Anthony Zeuli, Esq.
MERCHANT & GOULD P.C.
3200 IDS Center
80 South Eighth Street
Minneapolis, MN 55402

Re: Textron Innovations Inc. v. The Toro Company
Civil Action No. 05-486 (GMS)

Dear Tony:

In the unlikely event the Patent Office determines to proceed with reexamination of Textron's patents, either through *ex parte* or *inter partes* proceedings, Textron intends to vigorously oppose Toro in those efforts. Some of the most compelling evidence of the non-obviousness of the claimed inventions has come out during discovery in the pending action. Accordingly, Textron intends to provide the Patent Office with that compelling evidence during the requested reexaminations, should they go forward, including but not limited to the deposition testimony of Toro's witnesses and the documents Toro has produced in this matter.

We do not anticipate Toro will have a problem with this in light of the fact that Toro has already relied upon some of the evidence developed in this action in its reexamination requests. And we trust that Toro's motives for filing the reexamination requests were not for the purpose of shielding the fact-finder from this evidence. Accordingly, we ask that Toro confirm that — in the reexamination proceedings before the Patent Office, if any — the parties may submit to the PTO any evidence, including documents and deposition testimony, discovered in the ongoing litigation.

We would appreciate the courtesy of your response by close of business April 2, 2007.

Very truly yours,

A handwritten signature in black ink, appearing to read 'C. Campbell'.

Christopher C. Campbell

CCC/dpm

cc: Textron Delaware Correspondence List (via e-mail)

ATLANTA BANGKOK BEIJING BRUSSELS CHARLOTTE DALLAS HOUSTON KNOXVILLE LONDON
LOS ANGELES MCLEAN MIAMI NEW YORK NORFOLK RALEIGH RICHMOND SINGAPORE WASHINGTON
www.hunton.com

EXHIBIT D

Merchant & Gould

An Intellectual Property Law Firm

3200 IDS Center
80 South Eighth Street
Minneapolis, Minnesota
55402-2215 USA
TEL 612.332.5300
FAX 612.332.9081
www.merchant-gould.com

A Professional Corporation

Direct Contact | 612.371.5208
tzeuli@merchantgould.com

April 4, 2007

Sent via EMail

Christopher C. Campbell
Hunton & Williams LLP
1751 Pinnacle Drive
Suite 1700
McLean, VA 22102

Re: Textron Innovation Inc. v. The Toro Company
Our Ref: 6372.149USZA

Dear Chris:

Thank you for your letter of March 29, 2007. As you know, there is greater than a 90% probability that the Patent Office will reexamine all of the asserted claims from Textron's three patents-in-suit. You are correct that Toro's motivation for filing the reexaminations is to allow the Patent Office's new central reexamining unit the opportunity to determine patentability of the asserted claims in view of the considerable amount of printed prior art not provided to the initial examiner. Toro agrees that the Patent Office should not be precluded from considering information that is relevant and permissible under its reexamination rules. As reexaminations are open to the public, we understand your proposal to be that neither Textron nor Toro will object to submissions to the Patent Office of documents or deposition testimony that is labeled "Confidential" or "Attorneys-Eyes-Only" under the Protective Order entered by Judge Sleet. If we are correct in our understanding of your proposal, please confirm and we will both abide by that agreement during the reexaminations. If we have misunderstood your proposal, please let us know.

Very truly yours,


Anthony R. Zeuli

ARZ:cmf

Minneapolis/St. Paul
Denver
Seattle
Atlanta
Washington, DC

EXHIBIT E

1 IN THE UNITED STATES DISTRICT COURT
2 IN AND FOR THE DISTRICT OF DELAWARE

3 - - -
4 TEXTRON INNOVATIONS INC., : Civil Action
5 Plaintiff, :
6 v. :
7 TORO COMPANY, :
8 Defendant. : No. 05-486-GMS

9 - - -
10 Wilmington, Delaware
11 Thursday, November 9, 2006
12 9:15 a.m.
13 Telephone Conference

14 BEFORE: HONORABLE GREGORY M. SLEET, U.S.D.C.J.

15 APPEARANCES:

16 EDMOND D. JOHNSON, ESQ.
17 The Bayard Firm
18 -and-
19 SCOTT L. ROBERTSON, ESQ., and
20 DAVID M. YOUNG, ESQ.
21 Hunton & Williams
22 (Washington, D.C.)
23 Counsel for Plaintiff

24 DAVID E. MOORE, ESQ.
25 Potter Anderson & Corroon, LLP
-and-
EARL D. REILAND, ESQ.
ANTHONY R. ZEULI, ESQ., and
THOMAS J. LEACH, ESQ.
Merchant & Gould
(Minneapolis, Minnesota)
Counsel for Defendant

1 September 22nd.

2 Obviously, there are going to be reasonable
3 constraints put on searches. For example, Brouwer did not
4 make --

5 THE COURT: Mr. Robertson, I think the issue has
6 been resolved. I think you and Mr. Zeuli can arrange his
7 access, and if he wants to look for that proverbial needle,
8 let him do it.

9 MR. ROBERTSON: Thank you, Your Honor.

10 THE COURT: Let's go to Bullet No. 2, Mr. Zeuli.

11 MR. ZEULI: One question and clarification. I
12 was suggesting that Mr. Robertson make available to us the
13 Johnson Creek facility and the Charlotte facility.

14 THE COURT: I think he said that he was willing
15 to do that.

16 MR. ZEULI: Thank you very much.

17 Bullet No. 2 --

18 MR. ROBERTSON: We don't own the Johnson Creek
19 facility.

20 THE COURT: Are you able to arrange access?

21 MR. ROBERTSON: We searched Johnson Creek
22 ourselves and already produced the documents from Johnson
23 Creek.

24 THE COURT: Are you able to arrange access to
25 Johnson Creek for Mr. Zeuli?

EXHIBIT F

1

1 IN THE UNITED STATES DISTRICT COURT
2 IN AND FOR THE DISTRICT OF DELAWARE

3 - - -

4 TEXTRON INNOVATIONS INC., : Civil Action

5 Plaintiff, :

6 v. :

7 TORO COMPANY, :

8 Defendant. : No. 05-486-GMS

9 - - -

10 Wilmington, Delaware
11 Thursday, January 11, 2007
12 9:30 a.m.
Telephone Conference

13 - - -

14 BEFORE: HONORABLE GREGORY M. SLEET, U.S.D.C.J.

15 APPEARANCES:

16 EDMOND D. JOHNSON, ESQ.

17 Pepper Hamilton LLP

18 -and-

19 SCOTT L. ROBERTSON, ESQ.

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21 (Washington, D.C.)

22 Counsel for Plaintiff

23 RICHARD L. HORWITZ, ESQ., and
24 DAVID E. MOORE, ESQ.

25 Potter Anderson & Corroon, LLP

-and-

26 ANTHONY R. ZEULI, ESQ., and

27 THOMAS LEACH, ESQ.

28 Merchant & Gould

29 (Minneapolis, Minnesota)

30 Counsel for Defendant

31

1 Then I am turning to Page 25, and I say, "One
2 question and clarification. I was suggesting that Mr.
3 Robertson make available to us the Johnson Creek facility
4 and the Charlotte facility."

5 Your Honor said, "I think he said that he is
6 willing to do that."

7 On Page 26 finally the Court says, "But I am
8 going to require that you" -- and you are referring to
9 Textron" -- "make every effort to have your client arrange
10 access."

11 THE COURT: Let's find out from Textron why that
12 hasn't been done.

13 MR. ROBERTSON: Your Honor, thank you.

14 It has been done, sir. Let me tell you the
15 efforts that have been made.

16 Just to refresh the Court, you recall, we no
17 longer control this company. It is now a new company called
18 I think Commercial Grounds Care. It is not under our
19 control. It is not owned by us. What we did shortly after
20 that call is called our point of contact there, a gentleman
21 by the name of Mark Wegner, again, no longer our employee,
22 and said, look, we would like to gain access to this
23 facility to make it available for an inspection.

24 Your Honor may also recall, we already inspected
25 it and produced responsive documents. But notwithstanding

EXHIBIT G

**THIS EXHIBIT HAS BEEN
REDACTED IN ITS ENTIRETY**

EXHIBIT H

1

1 IN THE UNITED STATES DISTRICT COURT
2 IN AND FOR THE DISTRICT OF DELAWARE

3

4 TETRON INNOVATIONS INC., : Civil Action

5 Plaintiff, :

6 v. :

7 TRO COMPANY, :

8 Defendant. : No. 05-486-GMS

9

10 Wilmington, Delaware
11 Thursday, January 11, 2007
12 9:30 a.m.
Telephone Conference

12

13

BEFORE: HONORABLE GREGORY M. SLEET, U.S.D.C.J.

14

APPEARANCES:

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Pepper Hamilton LLP

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(Washington, D.C.)

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-and-

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ANTHONY R. ZEULI, ESQ., and

THOMAS LEACH, ESQ.

23

Merchant & Gould

(Minneapolis, Minnesota)

24

Counsel for Defendant

25

1 Honor. We got a partial answer from them. What we really
2 need to know in going forward in this case is a straight
3 answer from them. Are they seeking lost profits in this
4 case? If so, what basis does this intellectual property
5 holding company -- it doesn't make any products or hasn't
6 lost any sales. On what basis is it suggesting such
7 damages? That is really what I need to know.

8 THE COURT: Mr. Robertson.

9 MR. ROBERTSON: I am happy to represent right
10 here on the record, Your Honor, we are not seeking lost
11 profits. We are seeking reasonable royalty. But part of
12 the problem, Your Honor -- this came up at the last
13 conference we had with you. I think the Court properly took
14 me to task for not having a full and complete
15 meet-and-confer with Mr. Zeuli on this issue. I can report
16 that we have had no meet-and-confer on this bullet point on
17 the letter that was raised today.

18 But the issues I raised in the last conference
19 call and after that, after the Court properly chastised me
20 for not having a meet-and-confer, we had a meet-and-confer.
21 We wrote Mr. Zeuli about the problems we had with the lack
22 of financial information and a Rule 30(b)(6) witness on
23 financial information that would form the basis of
24 supplementing an interrogatory.

25 As you will see when we get to the plaintiff's

EXHIBIT I

FOCUS - 1 of 4 DOCUMENTS

Warning
As of: Apr 07, 2007

UNION CARBIDE CHEMS. & PLASTICS TECH. CORP. and UNION CARBIDE CORP., Plaintiffs, Counter-Defendants, v. SHELL OIL CO., SHELL CHEMICAL CO., and CRI CATALYST CO., Defendants, Counter-Plaintiffs. SHELL OIL CO., Plaintiff, v. UNION CARBIDE CHEMS. & PLASTICS TECH. CORP. and UNION CARBIDE CORP., Defendants.

Civ. No. 99-CV-274-SLR (Consolidated), Civ. No. 99-846-SLR

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

2004 U.S. Dist. LEXIS 10730

June 9, 2004, Decided

SUBSEQUENT HISTORY: Affirmed in part and reversed in part by, Vacated by, in part, Remanded by *Union Carbide Chems. & Plastics Tech. Corp. v. Shell Oil Co.*, 2005 U.S. App. LEXIS 21425 (Fed. Cir., Oct. 3, 2005)

PRIOR HISTORY: *Union Carbide Chems. & Plastics Tech. Corp. v. Shell Oil Co.*, 270 F. Supp. 2d 519, 2003 U.S. Dist. LEXIS 12694 (D. Del., 2003)

DISPOSITION: Defendants' motion to exclude certain testimony of Dr. Parvez H. Wadia was denied. Defendants' motion for judgment as a matter of law on plaintiff's claim of willfulness was denied as moot per the jury's verdict. Defendants' motions for judgment as a matter of law or, in the alternative, for a new trial were denied. Plaintiffs' motion for judgment as a matter of law was denied. Plaintiff's motion for prejudgment interest was granted. Plaintiffs' motion for a permanent injunction was granted. Defendants' motion for a stay of the permanent injunction was granted.

COUNSEL: [*1] For UNION CARBIDE CHEMICALS & PLASTICS TECHNOLOGY CORPORATION, UNION CARBIDE CORPORATION, plaintiffs (99-CV-274): Jeffrey B. Bove, Connolly, Bove,

Lodge & Hutz, Wilmington, DE.

For SHELL OIL COMPANY, SHELL CHEMICAL COMPANY, CRI CATALYST COMPANY, defendants (99-CV-274): Allen M. Terrell, Jr., Richards, Layton & Finger, Wilmington, DE.

For SHELL OIL COMPANY, plaintiff (99-CV-846): Jeffrey L. Moyer, Richards, Layton & Finger, Wilmington, DE.

For UNION CARBIDE CORPORATION, defendant (99-CV-846): Jeffrey B. Bove, Connolly, Bove, Lodge & Hutz, Wilmington, DE.

JUDGES: Sue L. Robinson, United States District Judge.

OPINION BY: Sue L. Robinson

OPINION:

MEMORANDUM OPINION

Dated: June 9, 2004
Wilmington, Delaware

ROBINSON, Chief Judge

2004 U.S. Dist. LEXIS 10730, *1

I. INTRODUCTION

On May 3, 1999 plaintiffs Union Carbide Chemicals & Plastics Technology Corporation ("UCC/PTC") and Union Carbide Corporation ("UCC" and collectively "Union Carbide") n1 filed this action against defendants Shell Oil Company, Shell Chemical Company, and CRI Catalyst Company (collectively "Shell"), alleging infringement of three United States patents owned by plaintiff. n2 In early 2001, the case was tried by a jury [*2] who found in favor of defendants on the issues of infringement and invalidity. Following the verdict, the court considered numerous motions by the parties for judgment as a matter of law. *Union Carbide Chems. & Plastics Tech. Corp. v. Shell Oil Co.*, 163 F. Supp. 2d 426 (D. Del. 2001). The case was subsequently appealed and, in November 2002, the United States Court of Appeals for the Federal Circuit affirmed in part and reversed in part the judgment and remanded the case for further proceedings. *Union Carbide Chemicals & Plastics Tech. Corp. v. Shell Oil Co.*, 308 F.3d 1167 (Fed. Cir. 2002).

n1 The court notes that all parties in their briefs, evidence, and arguments have largely treated the two plaintiffs and the two defendants as single entities. Consequently, except in the court's discussion of damages where the separate corporate existence is relevant, the court will similarly not distinguish.

n2 U.S. Patent No. 4,908,343 ("the '343 patent"); U.S. Patent No. 4,916,243 ("the '243 patent"); and U.S. Patent No. 5,057,481 ("the '481 patent").

[*3]

Between October 27 and November 3, 2003, a jury trial was held on the remanded issues. Submitted to the jury were Union Carbide's claims that Shell infringed claim 4 of the '243 patent and Shell's affirmative defenses of invalidity. The jury returned a verdict finding that Shell directly infringed claim 4 when it used its S-880 and S-882 catalysts in the production of ethylene oxide ("EO"). The jury also found that Shell's subsidiary, CRI, contributorily infringed claim 4 by selling to third parties Shell's S-863, S-880 and S-882 catalysts. The jury found that claim 4 was not invalid due to non-enablement, anticipation by prior art, or obviousness in light of the

prior art. Finally, the jury awarded damages in the amount of \$ 112,198,893. Presently before the court are the parties' twenty-four post-trial motions, as well as the court's findings of fact and conclusions of law with respect to Shell's equitable defenses of laches and estoppel.

II. BACKGROUND

A. The Patent-in-Suit and Asserted Claim

The '243 patent is the only patent remaining in the present case. The '243 patent was a continuation of prior U.S. application Ser. No. 763,273 filed August 7, 1985, which [*4] was a continuation of application Ser. No. 497,231 filed May 23, 1983, now abandoned, which was a continuation of application Ser. No. 116,292 filed February 13, 1980, now abandoned, which was a continuation-in-part of Ser. No. 021,727 filed March 20, 1979, now abandoned. As described in the specification, the '243 patent comprises a process for the commercial production of EO with a supported silver catalyst containing

a combination of (a) cesium and (b) at least one other alkali metal selected from the group consisting of lithium, sodium, potassium and rubidium, wherein (a) and (b) are present in amounts in relation to the amount of silver therein sufficient to increase the efficiency of the ethylene oxide manufacture to a value greater than the efficiencies obtainable under common operating conditions from respective catalysts which are the same as said catalyst except that instead of containing both (a) and (b), one contains the respective amount of (a), and the other contains the respective amount of (b).

('243 patent, col. 1, ll. 19-28) In short, this patent is directed to improved silver catalysts for the production of EO. EO is a chemical intermediate product, [*5] meaning it is a compound primarily used in the production of other chemical products. (D.I. 624 at 199-200) In the case of EO, it is a gas used in the production of ethylene glycol which is subsequently used in the production of synthetic substances such as polyester fiber, resin and film, and it is created when

2004 U.S. Dist. LEXIS 10730, *5

ethylene reacts with oxygen. n3 (Id. at 200-204)

n3 While ethylene glycol has more than one form, it is most commonly and profitably used in monoethylene glycol ("MEG"). Approximately 7.2 billion pounds of EO are produced each year, most of which is converted into MEG. Union Carbide and its parent corporation, Dow Chemical, produces approximately 1.4 billion pounds or twenty-five percent of the annual MEG domestic market. The average price of MEG is approximately \$ 0.25 per pound although that price is not stable. MEG sales are a growth market with about six percent annual domestic growth. (D.I. 624 at 204-08) As MEG is a fungible commodity, there is incentive for MEG manufacturers to reduce their cost structures. (D.I. 626 at 606-09)

[*6]

EO is produced through a highly exothermic reaction between ethylene and oxygen. n4 This process also results in the production of water and carbon dioxide. It is known in the art, however, that if certain catalysts, such as the one claimed in the patent, are present during this process, a lower reaction temperature may be employed. n5 A lower reaction temperature reduces the amount of oxygen and water byproducts and results in greater production efficiency. Production efficiency, sometimes referred to as "selectivity", is defined by the percentage of ethylene that is converted to EO. (D.I. 624 at 245)

n4 In the case of the EO production process described in the '243 patent, the temperature range is from 200 to 300 degrees celsius. ('243 patent, col. 29, ln. 56)

n5 A catalyst is a chemical that increases the rate of a chemical reaction without being consumed or altered. (D.I. 625 at 241-42, 381)

It was understood in the prior art that one such catalyst that enhances reaction efficiency is silver. Prior [*7] to 1971, EO reaction efficiencies using silver as a catalyst had an efficiency of no greater than 65 percent. In 1971, a Shell scientist determined that small amounts of alkali metals had a promotional effect on

silver-catalyzed EO reactions. These alkali metals when present in catalyzed EO reactions are referred to as "promoters." n6 ('243 patent, col. 3, ll. 43-61) In particular, it was learned that cesium when properly optimized could achieve an efficiency in the range of seventy-eight to eighty-two percent. (D.I. 625 at 304-06)

n6 These promoters are not themselves catalysts but act both to increase the efficiency of the reaction and to prolong the life span of the catalyst itself. It is also understood in the art that certain materials function as "inhibitors" in the EO reaction process by serving to reduce the amount of carbon dioxide produced. (D.I. 624 at 245-46; '243 patent, col. 3, ln. 30 - col. 4, ln. 47)

The '243 patent claims a process in which silver, cesium and at least one other alkali metal are [*8] combined to produce a synergistic effect, this synergistic effect being that the catalytic reaction efficiency is greater with the three materials present than with only silver and either cesium or one other alkali metal. ('243, col. 8, ll. 11-30; D.I. 625 at 270)

Claim 4, which is dependent on claim 1, is the only claim at issue in the case before the court and concerns a catalytic process in which silver, cesium and lithium are present. It claims:

1. In the continuous process for the production of ethylene oxide by the vapor phase oxidation of ethylene with molecular oxygen provided as an oxygen-containing gas at a temperature of from about 200 [degrees] C. to 300 [degrees] C. in the presence of at least about one mole percent of carbon dioxide and an organic chloride in the gaseous feed stream and in the presence of a supported, silver-containing catalyst in a fixed bed, tubular reactor used in commercial operations to form ethylene oxide, wherein said supported, silver-containing catalyst contains 2 to 20 weight percent silver deposited on a support which is in a form and size for use in the reactor, wherein (i) the specific reaction conditions of the ethylene oxide [*9] process; (ii) the specific catalyst

2004 U.S. Dist. LEXIS 10730, *9

support characteristics and (iii) the specific silver deposition method comprise an ethylene oxide production system, the improvement in which the catalyst comprises silver deposited on an alpha-alumina macroporous support in a first amount having a surface area less than $10 \text{ m}^2/\text{g}$ and contains a combination of (a) cesium in a second amount and (b) at least one other alkali metal selected from the group consisting of lithium, sodium, potassium and rubidium in a third amount, which combination comprises (a) and (b) in amounts in relation to the amount of silver in the catalyst sufficient to provide an efficiency of ethylene oxide manufacture that is greater than the efficiencies obtainable in the same ethylene oxide production system, including the same conversions, than (i) a second catalyst containing silver in the first amount and cesium in the second amount, and (ii) a third catalyst containing silver in the first amount and the alkali metal in the third amount, wherein the combination of silver, cesium and alkali metal in said catalyst is characterizable by an efficiency equation:

[See formula in printed version]

where $BA[1] = BRb$,

$BA[2] = BK$, [*10]

$BA[3] = BNa$,

$BA[4] = BLi$, and where the coefficient $b[0]$ through $b[9]$ and BG , BRb , BK , BNa , BLi and BCs are determined from a composite design set of experiments using the same ethylene oxide production system for the independent variables silver, cesium and alkali metal, and wherein BG is the difference of the average value of the silver content from the silver content used in the design set, BCs is the difference of the average value of the cesium content from the cesium

content used in the design set . . . and BLi is the difference of the average value of the lithium content from the lithium content used in the design set.

4. The process of claim 1 wherein said alkali metal is lithium.

('243 patent, col. 29, ln. 53 - col. 30, ln. 54)

In summary, claim 4 has four basic limitations, each containing various requirements: n7 (1) an EO process operated at specific reaction conditions; n8 (2) the catalyst used in the EO process comprises silver in a first amount, cesium in a second amount, and lithium in a third amount; (3) the efficiency obtainable from the EO process using the catalyst is greater than the efficiency of a process using (a) a second catalyst [*11] containing silver in the first amount and cesium in the second amount (but no lithium) and (b) a third catalyst containing silver in the first amount and lithium in the third amount (but no cesium), when operated in the same EO production system (the "comparison test"); and (4) the combination of silver, cesium and lithium is characterizable by the efficiency equation set fourth in claim 1 (the "characterizable test"). n9

n7 The court notes that while claim 4 is the only claim at issue, its limitations are substantially defined by claim 1. Consequently, throughout this memorandum the court's analysis frequently refers to claim 1.

n8 The '243 patent lists ten specific commercial reaction conditions. (D.I. 625 at 410-13)

n9 The characterizable test is an example of a statistical approach to comprehensive catalyst optimization. (D.I. 625 at 310; PTX 1079) Union Carbide's expert explained the efficiency equation as "a mathematical relationship between the amount of cesium and the amount of lithium that predicts the efficiency, correlates, actually, the change in efficiency with variations of cesium and lithium." (D.I. 625 at 419-20; '243 patent, col. 8 ln. 65 - col. 9 ln. 5)

[*12]

B. Federal Circuit's Claim Construction

The Federal Circuit describes the equation outlined in claim 1, upon which claim 4 depends, as "not a patented process for developing a synergistic catalyst but rather a descriptive tool that defines the scope of the patented invention: silver catalysts containing cesium and lithium in a combination that provides a synergistic, rather than an antagonistic or additive, effect." *Union Carbide*, 308 F.3d at 1178. Consequently, the Federal Circuit construed claim 1's limitation that the catalyst be "characterizable by an efficiency equation" to mean that "the claim limitation covers those catalysts that are described by the efficiency equation" or "capable of being described by an efficiency equation." *Id.* at 1178-79.

III. MOTIONS FOR JUDGMENT AS A MATTER OF LAW OR, IN THE ALTERNATIVE, FOR A NEW TRIAL.

Prior to submission of the case to the jury, Union Carbide and Shell each entered numerous motions, both oral and by written brief, for judgment as a matter of law. Where the jury's verdict was unfavorable, both parties have renewed post-trial their motions for judgment as a matter of law. These [*13] motions include the following: (1) Shell's motion for judgment as a matter of law and alternative motion for new trial on Union Carbide's claim of direct infringement (D.I. 605; D.I. 647-1; D.I. 647-2); (2) Shell's motion for judgment as a matter of law and alternative motion for new trial on Union Carbide's claim of contributory infringement (D.I. 609; D.I. 645-1; D.I. 645-2); (3) Union Carbide's motion for judgment as a matter of law on wilfulness (D.I. 662); (4) Shell's renewed motion for judgment as a matter of law and alternative motion for new trial on its invalidity defenses of anticipation and obviousness (D.I. 617; D.I. 651-1; D.I. 651-2); (5) Shell's motion for judgment as a matter of law and alternative motion for new trial on Shell's invalidity defense of indefiniteness (D.I. 611; D.I. 653-1; D.I. 653-2); (6) Shell's motion for judgment as a matter of law and alternative motion for a new trial on its invalidity defense of non-enablement (D.I. 613; D.I. 657-1; D.I. 657-2); and (7) Shell's motion for judgment as a matter of law on UCCPTC's claims for damages and alternative motion for a new trial or remittitur on the jury's damages verdict (D.I. 607; D.I. 655-1; D.I. 655-2). [*14]

A. Standards of Review

1. Judgment as a Matter of Law

To prevail on a renewed motion for judgment as a matter of law following a jury trial, the moving party "must show that the jury's findings, presumed or express, are not supported by substantial evidence or, if they were, that the legal conclusions implied [by] the jury's verdict cannot in law be supported by those findings." *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1348 (Fed. Cir. 1998) (quoting *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893 (Fed. Cir. 1984)). "Substantial" evidence is such relevant evidence from the record taken as a whole as might be acceptable by a reasonable mind as adequate to support the finding under review." *Perkin-Elmer Corp.*, 732 F.2d at 893. In assessing the sufficiency of the evidence, the court must give the non-moving party, "as [the] verdict winner, the benefit of all logical inferences that could be drawn from the evidence presented, resolve all conflicts in the evidence in his favor, and in general, view the record in the light most favorable to him." *Williamson v. CONRAIL*, 926 F.2d 1344, 1348 (3d Cir. 1991); [*15] *Perkin-Elmer Corp.*, 732 F.2d at 893. The court may not determine the credibility of the witnesses nor "substitute its choice for that of the jury between conflicting elements of the evidence." *Perkin-Elmer Corp.*, 732 F.2d at 893. In sum, the court must determine whether the evidence reasonably supports the jury's verdict. See *Dawn Equip. Co. v. Ky. Farms Inc.*, 140 F.3d 1009, 1014 (Fed. Cir. 1998).

2. Motion for a New Trial

Federal Rule of Civil Procedure 59(a) provides, in pertinent part:

A new trial may be granted to all or any of the parties and on all or part of the issues in an action in which there has been a trial by jury, for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States.

Fed. R. Civ. P. 59(a). The decision to grant or deny a new trial is within the sound discretion of the trial court and, unlike the standard for determining judgment as a matter of law, the court need not view the evidence in the light

most favorable to the verdict winner. See *Allied Chemical Corp. v. Daiflon, Inc.*, 449 U.S. 33, 36, 66 L. Ed. 2d 193, 101 S. Ct. 188 (1980); [*16] *Olefins Trading, Inc. v. Han Yang Chem. Corp.*, 9 F.3d 282 (3d Cir. 1993); *LifeScan Inc. v. Home Diagnostics, Inc.*, 103 F. Supp. 2d 345, 350 (D. Del. 2000), aff'd per curiam, Nos. 00-1485, 00-1486, 13 Fed. Appx. 940, 2001 WL 345439 (Fed. Cir. Apr. 6, 2001) (citations omitted). Among the most common reasons for granting a new trial are: (1) the jury's verdict is against the clear weight of the evidence, and a new trial must be granted to prevent a miscarriage of justice; (2) newly-discovered evidence exists that would likely alter the outcome of the trial; (3) improper conduct by an attorney or the court unfairly influenced the verdict; or (4) the jury's verdict was facially inconsistent. See *Zarow-Smith v. N.J. Transit Rail Operations*, 953 F. Supp. 581, 584 (D.N.J. 1997) (citations omitted). The court must proceed cautiously, mindful that it must not substitute its own judgment of the facts and the credibility of the witnesses for those of the jury. The court should grant a new trial on the basis that the verdict was against the weight of the evidence only where a miscarriage of justice would result if the verdict were to stand. See [*17] *Williamson*, 926 F.2d at 1352; *EEOC v. Del. Dep't of Health and Soc. Servs.*, 865 F.2d 1408, 1413 (3d Cir. 1989).

B. Direct Infringement

Shell filed a motion for judgment as a matter of law or, in the alternative, for a new trial, contending that Union Carbide failed to provide a legally sufficient evidentiary basis for a reasonable jury to conclude that Shell literally infringed claim 4 of the '245 patent directly. n10 Shell alleges the following basis for its motion on direct infringement: (1) Union Carbide did not conduct its tests of Shell's catalysts at the "same conversions;" (2) Union Carbide did not vary silver in the design set of experiments; (3) Union Carbide did not conduct the characterizable test and comparison test in the "same ethylene oxide production system;" (4) Union Carbide failed to prove infringement because the differences in efficiencies are within experimental error; (5) Union Carbide did not properly prepare Shell's catalysts; and (6) Union Carbide did not properly test Shell's rhenium catalysts.

n10 Shell originally filed a motion for judgment as a matter of law on direct infringement on November 3, 2003, prior to

submission of the case to the jury. (D.I. 605) Shell filed its renewed motion on December 22, 2003. (D.I. 647)

[*18]

1. Same Conversion

The comparison test of claim 1 of the '243 patent requires "an efficiency of ethylene oxide manufacture that is greater than the efficiencies obtainable in the same ethylene oxide production system, including the same conversions." ('243 patent, col. 30, 11. 9-12) Union Carbide's expert testified that he maintained the same conversion by measuring EO in the outlet. (D.I. 626 at 562-569) Based upon the specification's definition of conversion, Shell contends that Union Carbide's expert should have conducted his experiment by measuring whether ethylene conversion was constant rather than measuring EO in the outlet. (D.I. 648 at 9-10) It is not disputed that the '243 patent, its prosecution history and the prior art recognize that catalyst efficiencies may be compared at constant EO in the outlet, constant oxygen conversion, or constant ethylene conversion. ('243 patent, col. 11, 11. 14-21; JTX 4 at 112-13, 128-29; JTX 7 at 101, 113-15, 534-35; D.I. 625 at 509-10; D.I. 648 at 9) Moreover, as Union Carbide's infringement expert explained, once efficiency is determined by any of these three measurements, obtaining the conversion rate of the other two is a matter [*19] of basic stoichiometry. n11 (D.I. 526 at 512) Union Carbide's use of EO in the outlet was not improper and was evidence by which a reasonable jury could find direct infringement.

n11 In presenting its defense, Shell itself argued the propriety of performing such calculations. (D.I. 627 at 857, 859, 917-19)

2. Variance of Silver

The plain language of the claim at issue requires that the combination of silver, cesium and lithium in a catalyst used in an accused process be "characterizable" by a particularly defined efficiency equation. Claim 1 further requires that the coefficients of the efficiency equation be determined by testing catalysts in a composite design set of experiments which must include, as independent variables, silver, cesium and lithium. ('243 patent, col. 30, 11. 16-54) Shell contends that claim

1 requires that the amounts of silver be varied to determine the silver-related coefficients of the efficiency equation. (D.I. 648 at 13) Shell did not seek a jury instruction that claim 1 required [*20] that silver actually be varied to prove literal infringement. Conversely, Union Carbide contends that, as the actual amount of silver in the Shell catalysts was a known factor, it was not necessary for purposes of proving infringement to use varying amounts of silver. The plain language of claim 1 does not require silver to actually be varied. The jury heard conflicting expert testimony from both parties concerning this issue. The court finds that there was sufficient evidence by which a reasonable jury could conclude that proof of infringement did not require that silver actually be varied in order to satisfy the characterizable test limitation.

3. Appropriate Reaction Conditions

Claim 1 requires that the comparison test and characterizable test be conducted in the "same ethylene oxide production system" which, as the court instructed the jury, means "the laboratory or experimental 'conditions and parameters' which define the ethylene oxide production system which ultimately will be used commercially." (243 patent, col. 30, 11: 4-54; D.I. 601) Shell contends that this should mean the "specific reaction conditions of each commercial ethylene oxide process." (D.I. 648 at 15) [*21] As Shell's own brief reflects, its argument rests upon its interpretation of claim 1. (D.I. 696 at 11) The plain language of claim 1 and this court's construction thereof do not require that the specific reaction conditions of each commercial process be tested, only that the laboratory conditions and parameters define the process ultimately used. In the present case, sufficient evidence is in the record by which a reasonable jury could conclude that Union Carbide's expert's testing procedures were consistent with the requirements of "same ethylene oxide production system." (D.I. 625 at 444-57; D.I. 626 at 578-87; PTX 1101)

4. Range of Experimental Error

Shell contends that the differences in efficiency with respect to tests performed on Shell's catalysts by Union Carbide's expert were less than 1.31% and were within the range of experimental error for the comparative efficiency test. (D.I. 648 at 20) Consequently, Shell contends that the efficiency differences relied upon were not statistically significant. Statistical significance,

however, is a question of fact for the jury as it is an issue of evidentiary weight. The jury heard evidence by which they could conclude that [*22] the efficiency differences achieved were statistically significant. (PTX 2227; D.I. 625 at 473) Consequently, the court finds the records reasonably supports the jury's findings.

5. Preparation of Shell Catalysts

Shell contends that the Union Carbide expert's test catalysts were not representative of Shell's cesium-optimized catalysts and, therefore, no jury could conclude that the Shell catalysts infringe the 243 patent. The jury heard evidence that the amount of cesium used by Union Carbide's infringement expert was the optimum amount. (D.I. 625 at 438-439; PTX 331; D.I. 627 at 887-88; D.I. 628 at 1383-84) This was, therefore, an issue of disputed fact for the jury to resolve. Consequently, the court finds that there was sufficient evidence for a reasonable jury to conclude that the Union Carbide expert's tests were properly performed. Shell is not entitled to judgment as a matter of law.

6. Testing of Shell's Rhenium Catalysts

Shell contends that, with respect to the rhenium catalysts, Union Carbide's expert failed to properly optimize the chloride inhibitor and failed to properly pretreat the catalysts. (D.I. 648 at 21-22) The jury, however, heard testimony that [*23] the amount of chloride inhibitor used with the catalysts depends primarily on the amount of rhenium present. Union Carbide's expert testified that he optimized this amount consistent with the catalyst's requirements. (D.I. 628 at 1386; D.I. 625 at 450; D.I. 629 at 1387-88) Union Carbide's expert also testified that the pretreatment of rhenium catalysts with nitrogen was not required under the conditions at which his tests were performed. (D.I. 628 at 1380) Consequently, the jury heard sufficient evidence to support their finding that the Union Carbide expert's testing of the rhenium catalysts was proper and, therefore, supporting of a finding of infringement.

Accordingly, the court finds that Shell has failed to meet its burden with respect to its judgment as a matter of law on the claim of direct infringement. For the reasons stated above, the court also declines to find that the jury's verdict was against the clear weight of the evidence such that it shocks the court's conscience and, therefore, a new trial is not warranted. Shell's motions for judgment as a matter of law, or in the alternative, for a new trial will be

2004 U.S. Dist. LEXIS 10730, *23

denied. (D.I. 605; D.I. 647-1; D.I. 647-2)

C. Contributory [*24] Infringement

The jury returned a verdict finding Shell liable for contributory infringement of the '243 patent. (D.I. 602) Shell, in its motion for judgment as a matter of law, asserts the following arguments: (1) failure of proof with respect to a predicate act of direct infringement; (2) failure of proof with respect to the absence of substantial noninfringing use; (3) failure of proof with respect to CRI's knowledge of customers infringing uses of the catalysts. Alternatively, Shell moves for a new trial on the following bases: (1) the jury verdict form was erroneous; (2) the jury instructions were erroneous; and (3) the exclusion of *U.S. Patent No. 5,057,481* ("the '481 patent") was substantially prejudicial. (D.I. 646)

Section 271(c) provides for secondary liability for infringement of a United States Patent. To prove contributory infringement a plaintiff must demonstrate the following: (1) an offer to sell, sale, or import; (2) a component or material for use in a patented process constituting a material part of the invention; (3) knowledge by the defendant that the component is especially made or especially adapted for use in an infringement of such patent; and (4) the component [*25] is not a staple or article suitable for substantial noninfringing use. 35 U.S.C. § 271(c). Further, contributory infringement generally requires proof of actual direct infringement by a customer of the defendant. See *Novartis Pharmaceuticals Corp. v. Eon Labs Mfg., Inc.*, 363 F.3d 1306, 1308 (Fed. Cir. 2004). However, if use of the component by the defendant's customers necessarily infringes the patent, actual proof of an instance of direct infringement is not required. *Dynacore Holdings Corp. v. U.S. Philips Corp.*, 363 F.3d 1263, 1275-76 (Fed. Cir. 2004).

1. Predicate Act of Direct Infringement

In its motion and brief related to contributory infringement, Shell renews its arguments pertaining to direct infringement of the '243 patent. For the reasons discussed above, the court finds that a reasonable jury could conclude that there was an occurrence of a predicate act of direct infringement. See *infra* Part IV.B.

2. Substantial Noninfringing Use

Shell contends that the tests conducted by Union

Carbide's expert cannot be proof of the absence of substantial noninfringing use, as Union Carbide's expert did not [*26] test the catalysts at the specific reaction conditions used in the commercial process at issue. (D.I. 646 at 26) Union Carbide's expert testified that his tests demonstrated that the processes actually used by CRI customers would infringe the '243 patent. (D.I. 625 at 456-57) Union Carbide's expert explained that at different process conditions than those he used, the accused catalysts would still have an increased efficiency as required by the claims and would still meet the efficiency equation. (*Id.* at 479-80) The testimony of Union Carbide's expert is evidence that there is not a substantial noninfringing use of the Shell catalysts. Shell asserts that there are numerous conditions under which the catalysts may be used commercially and would not infringe but offered no evidence to the jury to that effect. Substantial noninfringing use is a question of fact for the jury and the Union Carbide expert's unrefuted testimony was sufficient evidence thereof.

3. CRI's Knowledge of Customers' Infringing Uses

Shell contends that Union Carbide failed to offer proof of the requisite knowledge for liability under 35 U.S.C. § 271(c). (D.I. 646 at 27) In so arguing, [*27] Shell renews arguments previously made at trial and rejected by the court. Shell contends that to be liable for contributory infringement, the law requires that CRI knew when it sold its catalysts to customers that the use of the catalysts in its customers' processes would infringe the '243 patent. n12 (D.I. 646 at 11)

n12 Union Carbide admitted that if "the law requires that Shell had knowledge that their catalysts met the efficiency equation there is no evidence that they had that knowledge." (D.I. 629 at 1466-67)

In *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, the Federal Circuit Court of Appeals described § 271(c) as requiring "proof of a defendant's knowledge, not intent, that his activity cause[s] infringement." 909 F.2d 1464, 1469 (Fed. Cir. 1990) (emphasis in original). This knowledge, according to the Court of Appeals, is a knowledge of both the component's particular use and "knowledge of the patent which proscribed that use." *Id.* at 1469 n.4. Consistent with [*28] the court's

interpretation of controlling authority, the jury was instructed that a finding of contributory infringement required proof that CRI acted "with knowledge that the component was especially made for use in a manner that infringes claim 4 of the '243 patent." (D.I. 601 at 21) Consequently, to the extent Shell's motion depends upon an interpretation of § 271(c) inconsistent with this court's jury instructions, its motion for a judgment as a matter of law will be denied. (D.I. 609, D.I. 645-1)

In the alternative, Shell moves for a new trial contending that the jury verdict form was erroneous, the jury instructions were erroneous and that the exclusion of the '481 patent was substantially prejudicial. The '481 patent was an issue determined by the court during pretrial evidentiary rulings. (D.I. 561) The verdict form was the subject of oral argument during the charge conference. (D.I. 628 at 1451-56; D.I. 629 at 1471-72) As Shell's motion depends upon arguments already rejected by the court, its motion for a new trial is denied. (D.I. 647-2)

D. Willfulness

Prior to submission of the case to the jury, Union Carbide orally moved for judgment as a matter of law on the [*29] issue of willful infringement. (D.I. 628 at 1396) The court declined to consider the motion and submitted it to the jury. The jury returned a verdict finding that Union Carbide had not shown by clear and convincing evidence that Shell had willfully infringed the '243 patent. On December 22, 2003, Union Carbide renewed its motion for judgment as a matter of law on willful infringement. (D.I. 662)

As grounds for its motion, Union Carbide asserts that it was undisputed that Shell had knowledge of the '243 patent prior to beginning to use or sell the Shell catalysts and that Shell lacked a good faith basis to believe that its uses or sales were not infringements thereof. (Id.) The jury heard evidence that Dr. Clendenen, a Ph.D. chemical engineer and patent attorney, was responsible for monitoring the technical aspects of Shell's catalyst business. (D.I. 625 at 360, 366, 790, 1092) Dr. Clendenen testified that he reviewed PTO publications for patents issued in the area for which he was responsible. He also reported patents which might require a legal opinion with respect to noninfringement. Dr. Clendenen testified that he reviewed the '243 patent and, in his opinion, determined that [*30] it did not require further action by Shell. (Id. at 371-72) Dr. Clendenen never sought further

action on the '243 patent and never told any other business person or decision maker at Shell about his belief. (Id. at 369-70; D.I. 627 at 1108, 1111) Shell, therefore, did not seek a legal opinion on the '243 patent. In light of Dr. Clendenen's testimony, the court finds there to be sufficient evidence by which a reasonable jury could conclude that Union Carbide did not meet its burden of proof. Union Carbide's motion for judgment as a matter of law on willfulness will be denied. (D.I. 662)

E. Non-Enablement

At the close of evidence and before submission of the case to the jury, Shell moved for judgment as a matter of law on its invalidity defense that claim 4 of the '243 patent is not enabled. (D.I. 613) The court declined to rule on Shell's motion and the jury returned a verdict finding the '243 patent to be valid. Post-trial, Shell renewed its motion for judgment as a matter of law that the '243 patent is invalid for lack of enablement. (D.I. 657) Shell contends that claim 4 of the '243 patent is not enabled for two reasons: (1) it requires undue experimentation to practice; [*31] and (2) it is inoperable. (D.I. 658)

Section 112 of the Patent Act states:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.

35 U.S.C.A. § 112. A patent is not enabled if it does not teach a person skilled in the art "to make and use the invention without undue experimentation." *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). "The determination of what constitutes undue experimentation in a given case requires the application of a standard of reasonableness, having due regard for the nature of the invention and the state of the art." Id. Several factors may be considered in determining whether experimentation is undue, including: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the

relative skill of those [*32] in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. See *id.* (quotations omitted).

Shell contends that the '243 *patent* requires undue experimentation because, "to fully enable the invention of claim 4, one would have to conduct the requisite tests to determine whether [the comparison test and characterizable test] were met and would have to conduct those requisite tests at every possible combination of reaction condition variables within the broad ranges of the preamble of claim 1." (D.I. 658 at 9) The jury, however, was presented with evidence that undue experimentation was not required. (D.I. 625 at 306-09, 460-62; D.I. 626 at 825-32)

Shell also contends claim 4 is inoperable, alleging that the "efficiency of an EO process using a catalyst containing silver, cesium, and lithium can never be greater than the efficiency of a process using a silver and cesium-only catalyst, or a silver and lithium-only catalyst, as required by claim 4." (D.I. 658 at 12) Shell's argument is one of fact that was resolved by the jury. The jury heard substantial evidence that Shell's catalysts showed that lithium increases efficiency. (D.I. 625 at [*33] 460-62) While Shell's experts dispute the conclusions of Union Carbide's expert, the jury resolved the dispute in Union Carbide's favor.

Consequently, the court finds that there was legally sufficient evidence for a reasonable jury to conclude that Shell did not prove its defense of nonenablement by clear and convincing evidence. Further, for the reasons stated above, the jury's verdict is not against the clear weight of the evidence such that it shocks the conscience of the court. Therefore, Shell's motion for judgment as a matter of law and, in the alternative, for a new trial will be denied. (D.I. 613; D.I. 657-1; D.I. 657-2)

F. Indefiniteness

At the close of evidence, Union Carbide, by oral motion, moved for judgment as a matter of law on Shell's defense of indefiniteness. (D.I. 628 at 1397) Shell also moved for judgment as a matter of law that claim 4 of the '243 *patent* was indefinite as a matter of law. (D.I. 611) That motion was renewed post-trial by Shell or, in the alternative, for a new trial. (D.I. 653)

After the presentation of evidence was completed, the court found that Shell had failed to adduce direct

evidence creating a disputed issue of fact as to whether [*34] claim 4 is indefinite. n13 (D.I. 628 at 1447) Consequently, the court declined to send Shell's defense of claim indefiniteness to the jury. (*Id.* at 1450) In so concluding, the court granted Union Carbide's oral motion for judgment as a matter of law that the '243 *patent* is not invalid for reason of claim indefiniteness and implicitly denied Shell's motion. n14 Consequently, the court shall construe Shell's renewed motion for judgment as a matter of law as a motion for reconsideration. (D.I. 612 at 2)

n13 Shell's enablement and indefiniteness defense, however, largely relied upon DTX 14, which the court precluded from evidence when it granted one of Union Carbide's motions in limine. (D.I. 561 at P18; D.I. 488)

n14 The court notes that the record is unclear as initially the court stated that it would reserve judgment and did not make it explicit on the record that the oral motion was granted. (D.I. 628 at 1400, 1450)

A motion for reconsideration may be entertained to "correct manifest errors of law or [*35] fact or to present newly discovered evidence." *Max's Seafood Cafe ex-rel. Lou-Ann, Inc. v. Quinteros*, 176 F.3d 669, 677 (3d Cir. 1999). Accordingly, a court may alter or amend its judgment if the movant demonstrates at least one of the following: (1) a change in the controlling law; (2) availability of new evidence not available when summary judgment was granted; or (3) a need to correct a clear error of law or fact or to prevent manifest injustice. See *id.*

The Patent Act requires patent claims to "particularly point out and distinctly claim the subject matter which the applicant regards as his invention." 35 U.S.C. § 112. Indefiniteness is a question of law. See *Personalized Media Communs., L.L.C. v. ITC*, 161 F.3d 696, 705 (Fed. Cir. 1998). In a jury trial, if there are disputed factual issues related to indefiniteness, they may be submitted to the jury for resolution. See e.g., *BJ Servs. Co. v. Halliburton Energy Servs.*, 338 F.3d 1368, 1372 (Fed. Cir. 2003). As a patent is presumed valid, a party asserting a defense of invalidity on the basis of claim indefiniteness has the burden of [*36] proof by clear and convincing evidence. See *Orthokinetics, Inc. v. Safety*

2004 U.S. Dist. LEXIS 10730, *36

Travel Chairs, Inc., 806 F.2d 1565, 1575-76 (Fed. Cir. 1986).

Shell presents three arguments for indefiniteness: (1) the use of a catalyst can simultaneously infringe or not infringe depending on the reaction conditions to test for infringement; (2) the test results of any catalyst would vary depending on the interpretation of conversion; (3) the absence of a criterion to determine whether a combination of silver, cesium and lithium is characterizable by the efficiency equation. (D.I. 654)

1. Effect of Reaction Conditions

In its first argument for indefiniteness, Shell asserts that the comparison test can be met using any set of reaction conditions within the broad range set forth in the preamble of claim 1 and, therefore, infringement will exist or not exist depending upon the particular reaction conditions selected by the party seeking to examine infringement. (D.I. 654 at 6-7) Union Carbide's evidence showed that, while the absolute value of efficiency measurements would change based upon the reaction conditions, the relative efficiencies would not. (D.I. 625 at 330-31, 478-80) Consequently, [*37] although a catalyst's absolute efficiency value may change at different test conditions, its comparative efficiency would not. (Id.) Shell, which bore the burden of proof on this issue, presented no evidence to contradict Union Carbide and, as a consequence, its defense of indefiniteness on these grounds fails as a matter of law.

2. Interpretation of Conversion

Shell next argues that claim 1, upon which claim 4 depends, is indefinite because test results of a catalyst would vary depending upon the measurement of conversion. (D.I. 654 at 12-14) Shell's argument, in this regard, regurgitates an argument it makes relating to direct infringement. For those reasons already discussed, the court finds Shell's defense of indefiniteness on these grounds fails. See *infra* Part III.B.1 (discussing measurement of conversion for purposes of determining infringement).

3. Criterion to Determine Whether Characterization Test Is Met

Shell's final argument for claim indefiniteness asserts that claim 1, upon which claim 4 depends, is indefinite because one of ordinary skill in the art would not know

how to determine whether a combination of cesium, lithium and silver would meet [*38] the characterizable test. (D.I. 654 at 14-15) Union Carbide's expert explained that using widely known statistical regression analysis, in particular R-squared, a person may determine how well test data is represented by a mathematical equation. (D.I. 625 at 423-24) Union Carbide's expert used this form of statistical analysis to determine whether Shell's catalysts were characterizable by the efficiency equation in claim 1. (D.I. 625 at 465-68) Moreover, the '243 patent itself discloses the use of such methods in the written description and describes them as routine. ('243 patent, col. 11, 11. 28-41) Failure to specify a particular means of measurement does not render a claim indefinite where a person of ordinary skill in the art would, nevertheless, be able to practice the invention. See *PPG Industries, Inc. v. Guardian Industries Corp.*, 75 F.3d 1558, 1563 (Fed. Cir. 1996). Shell presented no evidence to contradict the Union Carbide expert's assertion that R-squared provides an appropriate means of determining infringement or even to suggest that another method would be more appropriate. Consequently, the '243 patent's failure to specify a particular measurement method [*39] does not render it invalid.

Shell bore the burden of proof on its invalidity defense of claim indefiniteness, a burden which was not met. Therefore, the court's granting of judgment as a matter of law in favor of Union Carbide on this issue during the charging conference was proper as a matter of law. As Shell's arguments fail to show a clear error of law in the court's decision, Shell's motion for reconsideration shall be denied. (D.I. 653)

G. Anticipation and Obviousness

At the close of evidence, Shell moved for judgment as a matter of law on its invalidity defenses of anticipation and obviousness. (D.I. 618) The court declined to rule on Shell's motion and the case was submitted to the jury. The jury found that Shell did not prove by clear and convincing evidence that the '243 patent is invalid due to anticipation or obviousness. Shell has renewed its motion for judgment as a matter of law or, in the alternative, for a new trial. (D.I. 651)

1. Anticipation

Shell argues that the '243 patent is anticipated by *United States Patent No. 4,212,772*, and *Belgium Patent No. 867,045* (collectively "the Mross patents"). The

defense of invalidity due to anticipatory prior art [*40] requires proof by clear and convincing evidence that a single prior art reference discloses all of the limitations of the claim at issue. See 35 U.S.C. § 102; *Minnesota Mining & Mfg. Co. v. Johnson & Johnsons Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992). Even where the prior art reference does not expressly disclose a limitation of a claim at issue, a jury may find that the prior art inherently discloses the limitation. See *Atlas Powder v. IREOCO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999).

In the present case, in order to find that the Mross patents anticipated the '243 patent, a jury would have to find that the catalyst disclosed in the Mross patent (the "L1 catalyst") was an inherent disclosure of claim 1's characterizable test limitation. The jury heard evidence that, from Shell's expert's own results, the L1 catalyst is not characterizable by the efficiency equation. (D.I. 627 at 1051, 1090-91; D.I. 628 at 1389-90) As there was legally sufficient evidence for a reasonable jury to conclude that there was not clear and convincing evidence that the Mross patents anticipate the '243 patent, Shell's motion for [*41] judgment as a matter of law on anticipation will be denied. (D.I. 617; D.I. 651-1)

2. Obviousness

The defense of invalidity due to obviousness under the prior art requires proof by clear and convincing evidence that the differences between the claimed invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the relevant field. 35 U.S.C. § 103(a). In determining whether a claimed invention is obvious, the finder of fact considers the following four factors: (1) scope and content of the prior art; (2) differences between the prior art and the claimed invention; (3) level of ordinary skill in the pertinent field; and (4) secondary considerations such as commercial success, long felt but unsolved needs, failure of others that may shed light on the circumstances surrounding the origin of the subject matter sought to be patented. See *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966). See also *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 716 (Fed. Cir. 1991). Where obviousness is based [*42] on a single prior art reference, a party seeking to invalidate a patent must show a "suggestion or motivation to modify the teachings of that reference." *In re Kotzab*,

217 F.3d 1365, 1370 (Fed. Cir. 2000).

Shell argues that even if the Mross patents do not anticipate the '243 patent, they are proof that the '243 patent is obvious. According to Shell, the prior art teaches that lithium is an effective promoter; therefore, it would have been obvious to a person skilled in the art that using lithium in combination with cesium on the L1 catalyst would result in an EO process of a higher efficiency than that of an EO process using a silver/cesium or a silver/lithium catalyst. (D.I. 652 at 19)

As there was no evidence of an express suggestion in the prior art, whether the prior art contained an inherent suggestion was an issue of fact for the jury. While Shell offered evidence that efficiency was the central objective of EO catalysts and that a person skilled in the art with knowledge of the Mross patents could have created a catalyst that satisfied the limitations of claim 4, the jury also heard evidence regarding the unexpected results, long-felt need and commercial [*43] success of the claimed invention. (D.I. 624 at 204-06, 246-67; D.I. 625 at 266, 270, 275-78; D.I. 626 at 674-76, 750-51) Consequently, the court finds that there was legally sufficient evidence by which a reasonable jury could conclude that Shell failed to prove by clear and convincing evidence that the '243 patent was invalid due to obviousness. (D.I. 611; D.I. 653-1) Further, to the extent that Shell's motion depends upon arguments already discussed and rejected by the court, its motion for a new trial is denied. (D.I. 653-2)

H. Damages

Prior to submission of the case to the jury, Shell moved for judgment as a matter of law on Union Carbide's claims for damages. (D.I. 607) The court declined to rule on Shell's motion and the jury returned a verdict finding infringement and awarding \$ 112,198,893 in damages as a reasonable royalty. Shell has renewed its motion for judgment as a matter of law or, in the alternative, for a new trial or, in the alternative, for remittitur. (D.I. 655)

The parties agree that the appropriate measurement of damages in the present case is a reasonable royalty. A reasonable royalty is the amount a willing licensor and willing licensee would agree [*44] to in a hypothetical negotiation at the time infringement begins. See *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970). The Georgia-Pacific

factors include a wide variety of relevant factors which reasonable parties would take into consideration in a hypothetical negotiation. *Id.* at 1120.

The jury was given evidence that Shell's catalysts resulted in substantial savings on raw materials due to increased selectivity. (D.I. 625 at 682-83) The jury also heard evidence that Shell had used 5,102,436 pounds of the infringing catalysts internally. (D.I. 625 at 674-75; PTX 1094) At its own plants, this savings translated into approximately \$ 31 per pound of catalyst. (D.I. 625 at 674-75) The jury heard testimony showing that Shell realized a ten to thirty percent increase in production capacity, due to Shell's use at its own plants of the infringing catalysts. (*Id.* at 683-84) This increased production capacity resulted in a profit of approximately \$ 133 million or \$ 26 per pound of catalyst. Union Carbide's damages expert testified that at a hypothetical negotiation in 1993, the parties would have used the most [*45] conservative estimates of these savings and anticipated profits to reach a total value to Shell of \$ 41.27 per pound of catalyst used internally. (*Id.* at 686, 688-89, 692. Consequently, Union Carbide's damages expert testified that a reasonable royalty base would be \$ 20.63 per pound for Shell's internal infringing catalyst use, based upon a even sharing of the benefit to Shell. n15 (*Id.* at 697)

n15 Union Carbide's damages theory that a reasonable royalty base would be fifty percent of benefit Shell received from use of the infringing catalysts was supported by evidence of certain of Union Carbide's joint ventures. (D.I. 626 at 738) The fifty percent figure was also supported by UCCPTC's practice of not licensing its catalyst technology due to the effect such licensing would have on Union Carbide's competitors' cost structures. (*Id.* at 610-12)

With respect to external sales, the jury heard evidence that Shell generated an average profit of \$ 12.82 per pound of its S-863, S-880 and S-882 catalysts. [*46] (*Id.* at 701) The jury also heard evidence that Shell had sold nearly 9,862,290 pounds of the infringing catalysts. (*Id.* at 674-75; PTX 1096) Consequently, based upon a fifty percent share of Shell's profits from its external sales, Union Carbide's expert testified that a reasonable royalty would be \$ 6.41 per pound of catalyst sold. (D.I. 625 at 702-03).

Although Union Carbide sought a reasonable royalty in the amount of fifty percent of Shell's profits from external sales and fifty percent of the estimated benefit from internal use, the jury awarded \$ 13.62 per pound used internally and \$ 4.23 per pound sold to third parties. (D.I. 629 at 1603)

The crux of Shell's argument is that some of the factors considered by Union Carbide's damages expert, and presented to the jury, were either irrelevant, improper and/or prejudicial. In particular, Shell contends the following should not have been considered as factors in a hypothetical negotiation: (1) harm to Union Carbide Corporation ("UCC") as opposed to Union Carbide Chemicals & Plastics Technology Corporation ("UCCPTC"); (2) evidence pertaining to Shell's profits for MEG production; (3) evidence related to third parties' use [*47] of Shell catalysts; and (4) evidence of Shell's external leases of catalysts.

The present case presented a problem of first impression for this court, namely, the extent to which the impact on a nonexclusive licensee may be a factor considered in a reasonable royalty analysis where the nonexclusive licensee is the parent corporation of the patent holder and the patent holder is solely a technology holding corporation. n16 Shell argues that such a factor, even if a pertinent consideration, is unduly prejudicial. The court recognizes the risk that such evidence may permit a patent holder, not entitled to lost profits as a remedy, to nevertheless seek damages based in part upon lost profits. At trial, Shell objected to testimony from Union Carbide's damages expert that inaccurately portrayed the hypothetical negotiation to be between Union Carbide and Shell rather than UCCPTC and Shell. (D.I. 626 at 654) The court sustained the objection and required Union Carbide to correct the record before the jury and to inform them that the expert's analysis included no numbers associated with Union Carbide's potential lost profits. (*Id.* at 655-57) In reviewing the record, the court finds that [*48] the damages expert's analysis was properly based on a substantial number of factors and the impact on UCC, as a factor a hypothetical patent holder would consider, was only one component thereof. See *Rite-Hite Corp. v. Kelley Co., Inc.* 56 F.3d 1538, 1555 (Fed. Cir. 1995) ("The language of the statute requires 'damages adequate to compensate,' which does not include a royalty that a patentee who does not wish to license its patent would find unreasonable.").

2004 U.S. Dist. LEXIS 10730, *48

n16 This issue has appeared more than once and in more than one form over the course of the two trials in this case. (D.I. 561 at P35)

The remainder of Shell's objections also relate to what factors were relevant to the determination of a reasonable royalty rate. n17 In the present case, the court finds that the factors relied upon by Union Carbide's damages expert were consistent with the Georgia-Pacific standards and, as such, may be properly considered by the jury in determining a reasonable royalty base. The court also concludes that [*49] the damages award was supported by legally sufficient evidence on which a reasonable jury could rely. Consequently, Shell's motion for judgment as a matter of law will be denied. (D.I. 607; D.I. 655-1)

n17 One of these factors, Shell's actual profits from MEG, has repeatedly been the subject of motion practice. (D.I. 269; D.I. 270; D.I. 561 at P36)

Where a jury's award of damages is clearly unsupported and/or excessive, it is within the court's discretion to reduce the award to the maximum amount a jury could reasonably find. See *Spence v. Board of Educ.*, 806 F.2d 1198, 1201 (3d Cir. 1986). See also *Gumbs v. Pueblo Int'l Inc.*, 823 F.2d 768, 772 (3d Cir. 1987). In the present case, the court does not find that the jury award is so excessive that it shocks the conscience. In the present case, while Union Carbide presented evidence that in a hypothetical negotiation it would have been entitled to fifty percent of Shell's profits from its use and sale of the infringing catalysts, [*50] the jury concluded that thirty-three percent was an appropriate royalty. See *Rite-Hite Corp.*, 56 F.3d at 1555 (holding that it was "not unreasonable for the district court to find that an unwilling patentee would only license for one-half its expected lost profits and that such an amount was a reasonable royalty."). Viewing the evidence in the light most favorable to Union Carbide and giving Union Carbide the benefit of all reasonable inferences thereof, there is legally sufficient evidence to support the jury's award.

Consequently, Shell's motion for remittitur is denied. The court also finds that Shell has failed to establish that the verdict is against the great weight of the evidence

such that it shocks the conscience and, therefore, its motion for a new trial will also be denied. (D.I. 655-2)

In reviewing the jury's verdict on damages, however, the court found that the total damages awarded by the jury were inconsistent with their determination as to the reasonable royalty rate. n18 Based upon the undisputed evidence regarding the number of pounds of catalyst actually sold or used by Shell, the jury's royalty rate and total damages do not bear a mathematical [*51] relationship. n19 (D.I. 2197) While neither party raised this issue in its brief, it is well established the court has the inherent power to correct clerical errors in the record. *Fed. R. Civ. P. 60(a)*. This extends to include errors in jury arithmetic. See U.S. for and on *Behalf of Mississippi Road Supply Co. v. H. R. Morgan, Inc.*, 542 F.2d 262, 269 (5th Cir. 1976). Consequently, on its own motion the court will correct the verdict and judgment will be entered in the amount of \$ 111,212,665.02.

n18 Question seven of the jury verdict asked what "amount of damages do you find Union Carbide has proved by a preponderance of the evidence?" (D.I. 602) The jury responded with the figure of \$ 112,198,893. The jury then responded to questions eight and nine which asked for the reasonable royalty rate in dollars for Shell's internal use and external sales respectively. In response to question eight, the jury responded \$ 13.62 per pound. In response to question nine, the jury responded \$ 4.23. (Id.)

N19 The evidence showed that Shell used 5,102,436 pounds of catalyst internally and 9,862,290 pounds of catalyst externally. (D.I. 2197) Based upon the royalty rates determined by the jury, the amount of royalties owed by Shell would be \$ 69,495,178.32 for internal use and \$ 41,717,486.70 for external sales. Consequently, total damages based upon the royalty rate determined by the jury would be \$ 111,212,665.02 which is \$ 986,237.98 less than the amount reported on the jury sheet. As there is no rational explanation for this discrepancy, the court can only conclude that this resulted from mathematical error.

[*52]

IV. EQUITABLE ISSUES

On March 25, 2004, consistent with this court's practice, a bench trial was held on Shell's equitable defenses of laches and estoppel. (D.I. 700) Those equitable issues have been fully briefed and are ripe for decision. These are the court's findings of fact and conclusions of law pursuant to *Rule 52 of the Federal Rules of Civil Procedure*.

A. Laches

1. Shell contends that Union Carbide had actual and constructive knowledge of Shell's potentially infringing activities as early as April 1990 and that Union Carbide's delay in bringing suit was inexcusable and prejudicial as to Shell. (D.I. 786)

2. **Facts of Record.** In February 1988, representatives from Shell and Union Carbide met and discussed a new Shell catalyst which was reported to have "broken through the theoretical selectivity barrier" of 85.7%. (D.I. 628 at 1338-40) This high selectivity catalyst, S-879, contained cesium, lithium, rhenium and sulfur. (D.I. 626 at 808; DTX 274 at S334247) Shell disclosed that it did have a new high selectivity catalyst but that its life span was relatively short. (D.I. 628 at 1340-41) Shell did not disclose [*53] to Union Carbide at that time, or any other time prior to suit, the composition of the S-879 catalyst. (D.I. 1717-19, 1762-63)

3. In May 1998, Shell's European patent application for its rhenium based catalysts was first published, European Patent application 266,015 ("EPA '015"). In one of its sixty examples, the EPA '015 discloses a catalyst which exceeds the theoretical selectivity boundary of 85.7%. The preferred embodiment described in EPA '015 was a catalyst containing silver, rhenium and cesium only. (D.I. 700 at 1720-21)

4. Between August 1998 and February 1989, four more U.S. patents owned by Shell issued, including U.S. Patent Nos. 4,761,394, 4,766,105, 4,808,738, and 4,820,675 (the "U.S. Lauritzen patents"). The Lauritzen patents were all based on applications filed on October 31, 1986. The U.S. Lauritzen patents all disclose catalysts that include rhenium in addition to at least one alkali metal. By at least July 1988, Union Carbide scientists had reviewed EPA '015. (D.I. 700 at 1615-16, 1781-83; DTX 69 at U0093338)

5. Between 1988 and 1995, Union Carbide monitored publicly available information regarding Shell's catalysts and their commercial performance. Union Carbide [*54] had information indicating that Shell's rhenium catalysts had longevity problems. (D.I. 700 at 1789-94)

6. The first commercial use of an infringing Shell catalyst, S-880, occurred in July 1993.

7. Representatives of Shell and Union Carbide met in October 1995 and discussed prospects for collaboration. (D.I. 700 at 1799-1801) At that meeting, Union Carbide raised the issue that Shell may be infringing one of three Union Carbide patents. (D.I. 628 at 1345-46) Shell indicated it was aware of the Union Carbide patents and denied infringement. (Id.; D.I. 700 at 1662-63, 1809) Following the meeting, Union Carbide continued to monitor available information about Shell's activities. (D.I. 700 at 1663)

8. In 1996, Union Carbide attended a presentation by a Shell scientist. (Id. at 1811-13) It was the impression of the Union Carbide representative that Shell's high selectivity catalysts were achieving efficiencies between 85-88%. (Id. at 1811-14)

9. In 1997, Union Carbide attended Shell's presentation at the Gordon Conference. (PTX 103 at U183745; D.I. 700 at 1814-17) Following the Gordon Conference, Union Carbide believed that the composition of Shell's high selectivity catalysts [*55] may infringe one or more Union Carbide patents, including the '243 patent. (D.I. 700 at 1815-18) Union Carbide began internally reviewing the information it had obtained. (Id. at 1664-69, 1818-19)

10. In October 1998, Union Carbide initiated discussions with Shell toward reaching an amicable resolution of the potential infringement issues. Discussions toward an amicable resolution failed when Shell filed a declaratory judgment suit.

11. Throughout the relevant period, Shell has actively guarded the composition of its catalysts. (Id. at 1765; PTX72 at S076322) CRI's catalyst customers were contractually prohibited from conducting tests on the catalysts. Prior to discovery in this litigation, Union Carbide did not have any access to Shell's catalysts.

12. **Conclusions of Law.** It is well established that

2004 U.S. Dist. LEXIS 10730, *55

laches is a defense to a patent infringement suit brought in equity. See *Lane & Bodley Co. v. Locke*, 150 U.S. 193, 37 L. Ed. 1049, 14 S. Ct. 78 (1893); *Wollensak v. Reiher*, 115 U.S. 96, 29 L. Ed. 350, 5 S. Ct. 1137, 1885 Dec. Comm'r Pat. 310 (1885); *Mahn v. Harwood*, 112 U.S. 354, 28 L. Ed. 665, 5 S. Ct. 174 (1884). *A.C. Aukerman Co. v. R.L. Chaides Const. Co.* 960 F.2d 1020, 1028 (Fed. Cir. 1992). [*56] "In a legal context, laches may be defined as the neglect or delay in bringing suit to remedy an alleged wrong, which taken together with lapse of time and other circumstances, causes prejudice to the adverse party and operates as an equitable bar." *A.C. Aukerman Co.*, 960 F.2d at 1028-29.

13. To prevail on its equitable defense of laches, Shell must prove by a preponderance of the evidence that: (1) Union Carbide delayed filing suit for an unreasonable and inexcusable period from the time that Union Carbide knew or should have known of its infringement claim against Shell; and (2) Union Carbide's delay operated to Shell's prejudice or injury. *Id.* at 1032.

14. The first prong of a laches defense requires proof that the patent holder had either actual or constructive knowledge of infringing activity. See *Johnston v. Standard Min. Co.*, 148 U.S. 360, 370, 37 L. Ed. 480, 13 S. Ct. 585 (1893); *Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 1559 (Fed. Cir. 1997). Constructive knowledge imposes upon patent holders the duty to police their rights. See *Wanlass v. General Electric Co.*, 148 F.3d 1334, 1338 (Fed. Cir. 1998). [*57] Under a constructive knowledge theory of laches, a patentee is charged with "such knowledge as he might have obtained upon inquiry, provided the facts already known by him were such as to put upon a man of ordinary intelligence the duty of inquiry." *Johnston*, 148 U.S. 360 at 370, 37 L. Ed. 480.

15. The defense of laches focuses on the conduct of the patentee, not the infringer. Nevertheless, the infringer's activities are relevant to whether the patentee's conduct was reasonable, including the infringer's efforts to maintain the secrecy of its processes and its denials of infringement. See *Eastman Kodak Co.*, 114 F.3d at 1559. An infringer can not cloak its activities in secrecy and simultaneously accuse the patent holder of failing to adequately protect its rights. See, e.g., *Fromson v. Western Litho Plate and Supply Co.*, 670 F. Supp. 861, 868-69 (E.D. Mo. 1987), rev'd on other grounds by 853 F.2d 1568 (Fed. Cir. 1988). n20

n20 Laches, and a property owner's duty to police its rights, are universal concepts in property law. In fact, a patentee's duty to inquire is directly attributed to trademark law. Compare *Potash Co. v. Int'l Minerals & Chem. Corp.*, 213 F.2d 153, 155 (10th Cir. 1954) with *Johnston*, 148 U.S. at 370. The requirement that only activities which are open and notorious can give rise to a subsequent defense of laches insures that a patentee's rights will not be diminished in secret.

[*58]

16. The court finds that there is no evidence that Union Carbide had actual knowledge that Shell's catalysts infringed the '243 patent. Therefore, Shell can only prevail on its laches defense if it can establish that there were sufficient facts to warrant imputing constructive knowledge of Shell's infringing activities to Union Carbide and that Union Carbide's delay was unreasonable and inexcusable.

17. Where an infringer invokes the defense of laches based upon the patentee's constructive knowledge, the infringer must demonstrate that there were sufficient facts available to the patentee such that a duty to inquire arose. *Wanlass*, 148 F.3d at 1338. This duty to inquire commands that a patentee may not fail to police its property rights under circumstances where it has reason to suspect infringement. Circumstances which give rise to a duty to inquire must be "pervasive, open, and notorious" and include "sales, marketing, publication or public use of a product similar to or embodying technology similar to the patented invention, or published descriptions of the defendant's potentially infringing activities." *Id.* at 1339.

18. A patentee's duty to [*59] inquire is subject to a standard of reasonableness. As such, the extent to which a reasonable method of detection of infringement is available to the patentee is relevant. See *Wanlass*, 148 F.3d at 1334; *Wanlass v. Fedders Corp.*, 145 F.3d 1461, 1467 (Fed. Cir. 1998); *Hall v. Aqua Queen Mfg., Inc.*, 93 F.3d 1548 (Fed. Cir. 1996); *Imperial Chem. Mfg. Co. v. Stein*, 77 F. 612, 1897 Dec. Comm'r Pat. 285 (2d Cir. 1896).

19. As an initial matter, the court finds that Shell's activities occurring before July 1993, when S-880 was first commercially used, do not give rise to a duty to inquire. Any activities of Shell before that date can not be

said to have put Union Carbide on notice as they were not, in fact, infringing activities. Moreover, it is also relevant that Shell's actual infringing activities were concealed.

20. As result of its continuing efforts to remain abreast of its competitors' activities and of advances in technology, Union Carbide was aware that in the early 1990s, Shell was attempting to commercialize a high selectivity catalyst. Based upon Shell's patents, Union Carbide's belief that these were rhenium based and not mixed alkali [*60] based was reasonable. The fact that some examples contained in certain Shell patents disclosed mixed alkali catalysts raises only a suggestion and is not sufficient evidence that Shell was infringing the '243 patent. Even when combined with the fact that it was known to Union Carbide that Shell was attempting to commercialize a high selectivity catalyst, these facts are not sufficient evidence by which a reasonable person would conclude that Shell was infringing or was likely infringing the '243 patent. Instead, these facts at most give rise to a suspicion.

21. Union Carbide's decision to pursue its suspicion by directly inquiring of Shell in 1995 was consistent with a patentee exercising reasonable diligence. It is contrary to principles of equity for Shell to affirmatively represent in 1995 that its activities were noninfringing and then permit it to subsequently assert laches as a defense when Union Carbide, at least in part, relied on Shell's representations. Otherwise, the duty to inquire essentially becomes a duty to sue upon suspicion. While it is true that Union Carbide did not need to know the actual composition of Shell's catalysts to bring suit, that does not mean that [*61] its prudence in bringing suit was unreasonable.

22. Under the circumstances of the present case, including the secret nature of Shell's infringing activities, Union Carbide's reasonable diligence in monitoring the market, and Shell's resistance to Union Carbide's efforts to ascertain whether Shell infringed the '243 patent, the court finds that Union Carbide's conduct was not unreasonable.

B. Equitable Estoppel

23. Shell contends that Union Carbide's failure to bring suit misled Shell to believe that Union Carbide would not bring suit and Shell detrimentally relied upon that belief.

24. **Conclusions of Law.** Equitable estoppel is similar to laches but focuses on the reasonableness of the infringer's reliance rather than the unreasonableness of the patentee's delay. To obtain relief from enforcement of a patent under the doctrine of equitable estoppel, the defendant must prove by clear and convincing evidence three elements: (1) the patentee, through misleading conduct, led the infringer to reasonably infer that the patentee did not intend to enforce its patent; (2) reliance by the infringer on the patentee's misleading conduct; (3) material prejudice to the infringer. [*62] See *A.C. Auckerman Co.*, 960 F.2d at 1028.

25. Having already concluded that Shell failed to prove that Union Carbide had actual knowledge of Shell's infringing activities, Shell's defense of equitable estoppel fails. Union Carbide could not have affirmatively misled Shell that it would not enforce its patents, if Union Carbide did not have knowledge of Shell's infringement. Consequently, the court finds that Shell's defense of equitable estoppel fails.

V. PREJUDGMENT INTEREST

Pursuant to 35 U.S.C. § 284, Union Carbide filed a motion for the award of prejudgment interest. (D.I. 661) Union Carbide seeks prejudgment interest at the prime rate compounded annually from July 1993 until the entry of judgment. n21 The prime rate for the relevant period ranges from as low as 4% to as high as 9.5%. (D.I. 689, ex. A) Both parties seek a further expansion of the evidentiary record on this issue. (Id. at 4; D.I. 679 at 1) The court concludes, however, that further evidence is not necessary to resolve the issue.

n21 Union Carbide's brief is internally inconsistent on this point, initially asserting that interest should be compounded quarterly but later stating that it should be compounded annually. (D.I. 661 at 1-2, 4)

[*63]

The rate, if any, of prejudgment interest to be awarded is within the discretion of the court. See *Studiengesellschaft Kohle, m.b.H. v. Dart Industries, Inc.*, 862 F.2d 1564, 1580 (Fed. Cir. 1988). A patent holder need not prove that it borrowed at the prime rate in order to be entitled to prejudgment interest on that basis. See *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 939 F.2d 1540,

1545 (Fed. Cir. 1991). The determination of whether to award simple or compounded interest is within the discretion of the court. See *Rite-Hite Corp.*, 56 F.3d at 1555.

The court finds that the appropriate rate of interest to be awarded in the present case is the prime rate. Mindful of its discretion, the court finds that simple interest will adequately compensate Union Carbide in this case. Interest will be awarded for a period beginning on July 1, 1993 and ending on May 31, 2004. Based upon the jury award of \$ 112,198,893, the court finds that Union Carbide is entitled to prejudgment interest in the total amount of \$ 42,403,108.67. n22

n22 In calculating the interest, the court relied upon catalysts actually used internally and sold externally during each year beginning in July 1993. (D.I. 2204) The court then calculated simple interest for each year based upon the total accrued amount of catalyst used or sold through that year. (D.I. 689 ex. A) For the years 2003 and 2004 the court prorated the interest consistent with number of months for which interest was to be applied.

[*64]

VI. PERMANENT INJUNCTION

Union Carbide seeks a permanent injunction enjoining Shell from making, using, selling or offering for sale: (1) the Shell catalysts, S-880, S-882 and S-863, for use in a process for the production of ethylene oxide or (2) any other Shell catalyst falling within the scope of claim 4 of the '243 patent. In a patent infringement suit, a district court may grant a preliminary injunction pending trial or a permanent injunction "after a full determination on the merits." *High Tech. Med. Instr., Inc. v. New Image Indus., Inc.*, 49 F.3d 1551, 1554 (Fed. Cir. 1995). Indeed, the Federal Circuit has indicated that once a finding of infringement has been made, an injunction should issue absent a sufficient reason for denying it. *Richardson v. Suzuki Motor Co., Ltd.*, 868 F.2d 1226, 1247 (Fed. Cir. 1989). Courts, therefore, are given wide latitude in framing injunctive relief. See *KSM Fastening Sys., Inc. v. H.A. Jones Co.*, 776 F.2d 1522, 1527 (Fed. Cir. 1985). Nonetheless, consistent with the equitable nature of a permanent injunction, the court "must consider all

circumstances, including the adequacy of the [*65] legal remedy, irreparable injury, whether the public interest would be served, and the hardship on the parties and third parties". *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 659 F. Supp. 92, 94 (D. Del. 1987). Additionally, *Fed. R. Civ. P. 65(d)* requires an injunction to "set forth the reasons for its issuance, be specific in its terms, and shall describe in reasonable detail, and not by reference to the complaint or other document, the act or acts sought to be restrained; and is binding only upon the parties to the action." *Fed. R. Civ. P. 65(d)*.

In the present case, the court finds that Union Carbide will suffer irreparable harm without a permanent injunction to prevent Shell from practicing its patented catalytic process for the manufacture of EO. See *H.H. Robertson Co. v. United Steel Deck, Inc.*, 820 F.2d 384 (Fed. Cir. 1987). Further, the court finds that there are not countervailing equities in the present case to the patentee's right to exclude others from practicing the invention. Accordingly, the court finds that a permanent injunction is warranted. [*66]

The parties agree that the scope of the injunction should not include catalysts upon which damages were awarded by the jury. Therefore, the court will order a permanent injunction barring Shell from making, using or selling S-880, S-882 and S-863 catalysts which were not covered by the jury's damages award.

Shell seeks a stay of this injunction pending resolution of Shell's anticipated appeal to the Federal Circuit. (D.I. 681) Pursuant to *Fed. R. Civ. P. 62(c)*, it is within the discretion of the court to stay an injunction pending the outcome of an appeal of the judgment. A determination to stay a permanent injunction is guided by four factors: (1) likelihood of success on the merits of the appeal; (2) irreparable injury absent a stay; (3) substantial injury to the other party if the stay is granted; and (4) the public interest. *Hilton v. Braunskill*, 481 U.S. 770, 95 L. Ed. 2d 724, 107 S. Ct. 2113, (1987); *Standard Havens Products, Inc. v. Gencor Industries, Inc.*, 897 F.2d 511, 512 (Fed. Cir. 1990). The four factors often effectively merge as the likelihood of success is weighed with the equities affecting the parties and the [*67] public. *Standard Havens Products, Inc.*, 897 F.2d at 513.

With respect to the first factor, the parties have raised complex issues of law, issues which this court and the parties recognize would ultimately be resolved on appeal. Union Carbide can not fairly assert that a

2004 U.S. Dist. LEXIS 10730, *67

permanent injunction would not affect Shell's commercial practices as the record clearly demonstrates that the infringing catalysts are a substantial source of revenue. Further, the court is mindful of the fact that the legal holder of the patent is a technology holding company; there is nothing in the record to suggest that UCCPTC's interests would not be adequately protected through an appeal bond or similar assurance. Finally, the court finds that there are not unique public interests weighing in either party's favor in the present patent dispute. Consequently, the court finds that the equities in the present case substantially weigh in favor of maintaining the status quo. Therefore, the permanent injunction will be stayed pending the outcome of any appeals.

VII. CONCLUSION

For the reasons discussed above, the court will deny Shell's post-trial motions for judgment as a matter of law [*68] or in the alternative for a new trial. (D.I. 605, 607, 609, 611, 613, 615, 617, 645, 647, 649, 651, 653, 655, 657) The court will also deny Union Carbide's motion for judgment as a matter of law on its claim of willful infringement. (D.I. 662) The court has also found that Shell has failed to prove by clear and convincing evidence its equitable defenses of laches and estoppel. Therefore, the court will enter judgment in favor of Union Carbide for damages in the amount of \$ 111,212,665.02 and prejudgment interest in the amount of \$ 42,403,108.67. Finally, the court will grant Union Carbide's motion for permanent injunction (D.I. 665), but will also grant Shell's motion for a stay of the permanent injunction pending the outcome of any appeals. (D.I. 681) An order consistent with this opinion shall issue.

ORDER

At Wilmington, this 9th day of June, 2004, consistent with the memorandum opinion in the above captioned case issued this same day;

IT IS ORDERED that:

1. Defendants' motion to exclude certain testimony of Dr. Parvez H. Wadia is **denied**. (D.I. 704)
2. Defendants' motion for judgment as a matter of law on plaintiff's claim of willfulness is **denied as moot** per [*69] the jury's verdict. (D.I. 615)
3. Defendants' motions for judgment as a matter of

law or, in the alternative, for a new trial are **denied**. (D.I. 605; D.I. 607; D.I. 609; D.I. 611; D.I. 613; D.I. 617; D.I. 645-1; D.I. 645-2; D.I. 647-1; D.I. 647-2; D.I. 649; D.I. 651-1; D.I. 651-2; D.I. 653-1; D.I. 653-2; D.I. 655-1; D.I. 655-2; D.I. 657-1; D.I. 657-2)

4. Plaintiffs' motion for judgment as a matter of law is **denied**. (D.I. 662)

5. Plaintiff's motion for prejudgment interest is **granted**. (D.I. 661)

6. Plaintiffs' motion for a permanent injunction is **granted**. (D.I. 665)

7. Defendants' motion for a stay of the permanent injunction is **granted**. (D.I. 681)

8. IT IS THEREFORE ADJUDGED AND DECREED that, within fifteen (15) days after the entry of this order until April 10, 2007, the expiration date of *United States Patent No. 4,916,243* ("the '243 patent"), defendants Shell Oil Company, Shell Chemical Company and CRI Catalyst, their officers, agents, servants, employees, and attorneys as well as all persons in active concern or participation therewith are hereby enjoined from: (1) making, using, selling, or offering to sell in the United States the S-880, S-882 [*70] and S-863 catalysts used in a process for making ethylene oxide found by the jury in this case to have infringed claim 4 of the '243 patent, except that the injunction against said catalysts shall not apply to the use of any charges of those catalysts that were included in the plaintiffs' evidence at trial to support an award of damages; and (2) making, using, selling or offering to sell in the United States any other Shell catalyst falling within the scope of the catalyst limitations of claim 4 of the '243 patent for use in an ethylene oxide production system in the United States.

9. IT IS FURTHER ADJUDGED AND DECREED that, pursuant to *Fed. R. Civ. P. 62*, this permanent injunction is hereby stayed during the pendency of any appeals of the judgment in this case. The stay shall be effective until the issuance of the Federal Circuit's mandate of a decision on the merits of any appeal of the judgment of the case.

10. The clerk of the court is directed to enter judgment in favor of plaintiffs and against defendants in the amount of \$ 153,615,773.69.

2004 U.S. Dist. LEXIS 10730, *70

Sue L. Robinson

United States District Court

EXHIBIT J

3 of 6 DOCUMENTS



Caution

As of: Apr 07, 2007

**ROHM AND HAAS COMPANY, Plaintiff, v. BROTECH CORPORATION,
Defendant.**

Civil Action No. 90-109(RRM)

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

1992 U.S. Dist. LEXIS 21721; 24 U.S.P.Q.2D (BNA) 1369

July 16, 1992, Decided

COUNSEL: [*1] Rudolf E. Hutz, Esquire, N. Richard Powers, Esquire, and Jeffrey B. Bove, Esquire, Connolly, Bove, Lodge & Hutz, Wilmington, Delaware; and William E. Lambert, III, Esquire, Rohm and Haas Company, Philadelphia, Pennsylvania, for plaintiff.

Robert K. Payson, Esquire, Potter Anderson & Corroon, Wilmington, Delaware; Raphael V. Lupo, Esquire, and Jack Q. Lever, Jr., Esquire, William, Brinks, Olds, Hofer, Gilson & Lione, Washington, D.C.; Herbert B. Keil, Esquire, Keil & Weinkauf, Washington, D.C.; and Paul R. Rosen, Esquire, and Niels Korup, Esquire, Spector, Gadon & Rosen, P.C., Philadelphia, Pennsylvania, for defendant.

JUDGES: McKELVIE

OPINION BY: McKELVIE

OPINION:

OPINION

Wilmington, Delaware
July 16, 1992

McKELVIE, District Judge

This is a patent case. Rohm and Haas Company

("Rohm and Haas") alleges Brotech Corporation ("Brotech") is infringing four of its patents relating to ion exchange resins or adsorbents.

In March of this year, the Judge previously assigned to this case granted Brotech's motion to stay the proceedings pending completion of the Patent and Trademark Office's ("PTO") reexamination of one of the patents. Thereafter, this case was reassigned to me and Rohm and Haas requested that the stay [*2] be lifted. For the following reasons, the Court will grant the request, lift the stay, and schedule the case for trial.

1. Nature and Stage of the Proceedings

Rohm and Haas filed this action in March of 1990. It alleges Brotech is infringing four of its patents, Nos. 4,224,415 ("415"), 4,256,840 ("840"), 4,382,124 ("124") and 4,818,733 ("773"). The '415, '840 and '124 patents were invented by Erich Meitzner and James Oline, former Rohm and Haas employees. These patents relate to macroporous cross-linked copolymer beads and adsorbents, ion exchange resins made from them, and their preparation. Rohm and Haas acquired rights under the fourth patent, '773, through the acquisition of Diamond Shamrock in the mid-1980's. It relates to specially synthesized alkylaminophosphonic chelating resins, the process of making such ion exchange resins, and the methods for using them.

1992 U.S. Dist. LEXIS 21721, *2; 24 U.S.P.Q.2D (BNA) 1369

These ion exchange resins or adsorbents are used for water softening and deionization, sugar refining, waste treatment, chemical analysis and a number of other applications. Macroreticular ion exchange resins or adsorbents give fast ion exchange, have low resistance to fluid flow, give good strength and rigidity, [*3] allow only small volume changes in various solvents and have an improved resistance to oxidation and shock.

The Court has entered a series of scheduling orders in the case. The most recent order provided for a cut-off of fact discovery in April of this year and a non-jury trial beginning in October.

In September of 1991, a law firm filed a request with the PTO for a reexamination of the '415 patent pursuant to 35 U.S.C. §§ 301-307. The firm filed the request on behalf of an undisclosed client, an anonymous third party requestor. The request alleged, among other things, that the '415 patent is anticipated by, or obvious in view of, a patent previously issued to Clarke.

In November of 1991, the PTO granted reexamination of the '415 patent on the basis that the Clarke patent raises a substantial new question of patentability as to claims 1, 2, and 4 through 12 of the patent.

In December of 1991, Brotech moved to stay this litigation. In its motion, Brotech argued that the Court should exercise its discretion to stay the case pending the outcome of the reexamination, as it was likely the PTO would invalidate or narrow the scope of the '415 patent and, [*4] by extension, the '840 and '124 patents.

In March of 1992, the Judge previously assigned to this case granted that motion and entered an order staying the proceedings pending completion of the reexamination. She found that the technical expertise to be gained by a PTO decision, which may clarify the issues with regard to discovery and ultimately for trial, weighed toward deferring to the reexamination procedure. She concluded that the benefits to be gained by staying the litigation pending reexamination outweighed the detrimental effects of a delay in the resolution of the litigation. She further noted that the Court could lift the stay at any time the Court finds it no longer appropriate.

This case was reassigned to me on March 31, 1992. On May 22nd, Rohm and Haas filed a status report on the

reexamination and reported that, in a first office action, the PTO had found claims 3 and 10 of the '415 patent to be patentable over the prior art. It rejected claims 1, 2, 4, 5 through 9, 11 and 12 under 35 U.S.C. §§ 102(b) and 103, as either anticipated by or unpatentable over Clarke. With that report, Rohm and Haas requested that the Court lift the stay. [*5]

The Court reviewed the request to lift the stay at a June 25th status conference. At that conference, Rohm and Haas' counsel reported that claims 3 and 10 of the '415 patent cover all of Brotech's ion exchange resin products that are at issue insofar as the '415 patent is concerned and argued that the litigation would, therefore, go forward in any event at the completion of the reexamination. As to the balance of the claims of the '415 patent, counsel reported that Rohm and Haas had requested a reconsideration of the initial action and, in late June, the Examiner had indicated in an interview claims 6 through 9, 11, and 12 are deemed to be patentable.

Counsel for Brotech argued that nothing had really changed since the Court had previously granted the stay. "Until the Patent Office says this is final, and until it goes out the door with a certificate of reexamination, anything can happen to those claims." Docket Item ("D.I.") 364 at 14. In opposing a lifting of the stay, he estimated that the reexamination process would take twelve to eighteen months from start to finish. D.I. 364 at 15. (As the PTO granted reexamination in November of 1991, this suggests the process will be completed [*6] between November of 1992 and May of 1993.)

2. Review of the Decision to Stay the Case

At the status conference, counsel for Brotech cited *Geibel v. United States*, 667 F. Supp. 215 (W.D.Pa. 1987), aff'd, 845 F.2d 1011 (3d Cir. 1988) and *Schultz v. Onan Corp.*, 737 F.2d 339 (3d Cir. 1984) for the proposition that the decision and order staying the case was the law of the case and could be set aside only if this Court found it clearly erroneous. This argument appears to be inconsistent with the arguments Brotech made in urging the Court to exercise its discretion to grant a stay. "Just as the Court has inherent discretionary power to order a stay of litigation pending reexamination, *Gould v. Control Laser Corp.*, 705 F.2d 1340, 1342 (Fed. Cir. 1983), the Court has the power to lift or otherwise modify the stay if, in the Court's opinion, a stay is no longer

1992 U.S. Dist. LEXIS 21721, *6; 24 U.S.P.Q.2D (BNA) 1369

warranted. . . . It is absurd to suggest that this Court would lose jurisdiction and control over the litigation before it." Brotech's Reply Brief in Support of its Motion for a Stay, D.I. 309 at 8.

Rohm [*7] and Haas' request to lift the stay is not a request that the Court modify or change the law of the case. Rather, it is a request that the Court reexamine the factual and procedural circumstances to determine whether maintaining the stay is appropriate.

3. Facts and Circumstances That Suggest the Stay Should be Lifted

There are two sets of facts and circumstances the Court has looked to in determining that the stay should be lifted. First, the information from the PTO confirms that at least some of the claims will survive reexamination. We know that those claims probably will have to be resolved in this litigation. With the current status of the Court's calendar, if we put the case back on track for trial, the trial would be scheduled to commence in approximately ten months, or May of 1993. Lifting the stay would ensure a relatively prompt trial at a time when there is a substantial probability that the PTO will have completed its reexamination. The advantages of setting a date certain for a trial that will probably have to go forward outweigh the disadvantages of the uncertainty of the impact that the reexamination may have and the added expense the parties may incur in preparing [*8] the case for trial while the reexamination proceeds.

The second set of facts and circumstances that suggest the stay should be lifted relate to the Civil Justice Reform Act of 1990, by which Congress has attempted to address the problems of the costs and delays in our courts. See 28 U.S.C. § 471 note (Supp. 1992).

That Act provides that each United States district court shall develop a civil justice expense and delay reduction plan that shall consider and may include six principles and guidelines of litigation management to reduce costs and delays in litigation. They are: (1) a systematic, differential treatment of civil cases that tailors the level of individualized and case specific management to the nature of the case; (2) early and ongoing judicial involvement that includes, inter alia setting early, firm trial dates that occur within eighteen months after the filing of the complaint; (3) careful and deliberate monitoring of cases through case-management conferences; (4) encouraging cost-effective discovery; (5)

requiring that discovery motions include a certification that counsel has made a good faith effort to resolve the matter; and [*9] (6) referring certain cases to alternative dispute resolution programs. See 28 U.S.C. § 473 (Supp. 1992).

Delaware has been designated under the Act as one of the districts responsible for developing a pilot program to implement an expense and delay reduction plan that will be reviewed and evaluated in a report the Judicial Conference is to submit to the Committees on the Judiciary of the Senate and House of Representatives no later than December 31, 1995. See 28 U.S.C. § 471 note (Supp. 1992). Pursuant to that designation, and with the assistance of a local advisory committee, the court has developed and adopted a plan and is in the process of amending its local rules consistent with that plan. See 28 U.S.C. § 471 note and § 478 (Supp. 1992). With the addition of a fourth active judge to the court at the end of March of 1992, and the development of proposed amendments to the local rules, the court is now moving to implement that plan.

From the Court's perspective, a primary theme of the plan is that we can reduce the costs and delays in litigation by working to [*10] shorten the time period from the date of filing of the complaint to the final disposition of the matter. With active case management and a goal of having cases tried within twelve months from the date of the filing, we can work to secure the just, speedy, and inexpensive determination of every action. See *Fed. R. Civ. P. 1*.

There is some question as to how our plan and this approach will work in patent cases, not just because counsel and the parties may see them as complex, but also because of procedural problems that may be unique to patent cases. One example of that type of problem is the reexamination process, which has the potential to delay cases for eighteen months.

The legislative history of The Patent Act of 1980 suggests that Congress established the patent reexamination procedure in an attempt to accomplish some of the very same goals it identified in the Civil Justice Reform Act. See e.g., H.R. Rep. No. 1307, 96th Cong., 2nd Sess. 1 (1980), reprinted in 1980 U.S.C.C.A.N. 6460, 6462-63 ("Reexamination will permit efficient resolution of questions about the validity of issued patents without recourse to expensive and lengthy infringement litigation. . . . A new [*11] patent

1992 U.S. Dist. LEXIS 21721, *11; 24 U.S.P.Q.2D (BNA) 1369

reexamination procedure is needed to permit the owner of a patent to have the validity of his patent tested in the Patent office where the most expert opinions exist and at a much reduced cost. . . . The reexamination of issued patents could be conducted with a fraction of the time and cost of formal legal proceedings and would help restore confidence in the effectiveness of our patent system.")

The statistical information available on the procedure shows that the average time for the completion of a reexamination is approximately 18.2 months. PTO, Reexamination Filing Data, Mar. 31, 1991, at 3 (D.I. 306 at Attachment C). When the Patent Office orders reexamination, all claims were confirmed in approximately 24% of the cases, all claims were canceled in approximately 12% of the cases, and some claims were changed in approximately 64% of the cases. *Id.*

These statistics suggest that in a typical case there is a substantial probability a reexamination will have a major impact on the issues to be resolved in the litigation, but that despite the PTO's steps to ensure special dispatch in reexamination, if a court stays litigation pending reexamination, the stay may add eighteen [*12] months to the time for the resolution of the case.

In this case, certain factors suggest that a stay does not serve the objectives of The Patent Act of 1980. For example, if a purpose of the statute is to provide an

inexpensive method for the patent owner to test the validity of its patent, that interest is not being served here. First, the reexamination has been initiated at the request of an anonymous person, rather than the patent owner. Second, the reexamination probably will not resolve the disputes between the parties. Third, in light of the nature and extent of the litigation to date, it does not appear that the reexamination will have a substantial impact on reducing the costs of the litigation.

The added factor of the experimental nature of the court's role as a pilot district under the Civil Justice Reform Act also suggests that the stay should be lifted. During this period when we are testing and evaluating our plan to see if it can help solve the problems Congress has identified, the court should be prepared to see if the experiment works on as broad a spectrum of cases as possible. It may be that the court and others will conclude in a few years that the approach the [*13] court has taken in the plan will have to be modified in certain types of cases, such as this one. On the other hand, we may find that for parties such as we have here, with a dispute of this nature, a stay for reexamination tends to defeat, rather than accomplish the goal of a just, speedy, and inexpensive determination of the dispute.

The Court will enter an order lifting the stay and setting the case for trial.

EXHIBIT K

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TEXTRON INNOVATIONS INC.,

Plaintiff,

V.

C. A. No. 05-486 (GMS)

JURY TRIAL DEMANDED

THE TORO COMPANY,

Defendant.

NOTICE OF VIDEOTAPED DEPOSITION OF FRED EBERLEIN

To: The Toro Company and its attorneys:

Anthony R. Zeuli
MERCHANT & GOULD P.C.
3200 IDS Center
80 South 8th Street
Minneapolis, MN 55402

Richard L. Horwitz
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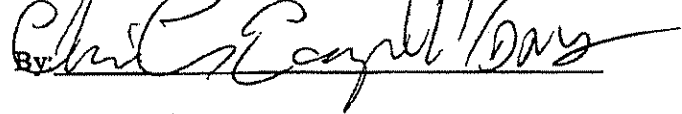
PLEASE TAKE NOTICE that Plaintiff, **Textron Innovations Inc.**, will take the deposition by oral examination of **Fred Eberlein** commencing on **November 14, 2006**, beginning at **9:00 a.m.** at the offices of **Hunton & Williams LLP**, Bank of America Plaza, Suite 4100, 600 Peachtree Street, N.E., Atlanta, Georgia or at some other place mutually agreed upon by counsel.

Said deposition will be taken by stenographic and videographic means before a notary public and will continue from day to day as necessary until completed.

Dated: October 17, 2006

Respectfully submitted,

TEXTRON INNOVATIONS INC.

By: 

OF COUNSEL:

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Attorneys for Plaintiff
TEXTRON INNOVATIONS INC.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TEXTRON INNOVATIONS INC.,

Plaintiff,

v.

THE TORO COMPANY,

Defendant.

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C. A. No. 05-486 (GMS)

CERTIFICATE OF SERVICE

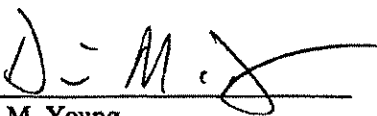
I hereby certify that a true and correct copy of the following document:

NOTICE OF VIDEOTAPED DEPOSITION OF FRED EBERLEIN

has been served on the following individuals via electronic mail this 17th day of October, 2006:

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Date: October 17, 2006



David M. Young

Tony Zeuli

From: Campbell, Chris [ccampbell@hunton.com]
Sent: Wednesday, February 07, 2007 5:23 PM
To: Tony Zeuli
Cc: Robertson, Scott; Young, David
Subject: Meet and Confer

Tony,

We would like to meet and confer with you tomorrow regarding Textron's remaining 30(b)(6) topics, the witnesses and dates. And also would like to meet and confer with you about when we can have Mr. Conry back.

We would also like to take Mr. Eberlein's deposition on Feb. 23rd in my firm's Atlanta office as noticed. Please confirm that Mr. Eberlein will appear pursuant to the original subpoena and please let us know who is representing him as we wish to speak with his counsel.]

Thanks,

Christopher C. Campbell
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04/10/2007